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A HISTORY OF MODERN CULTURE

BY

PRESERVED SMITH

HON. LITT. D. AMHERST

PROFESSOR OF HISTORY IN CORNELL UNIVERSITY

VOLUME II

THE ENLIGHTENMENT

1687-1776



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PREFACE

The understanding of history can be advanced only by the combination, or alternation, of analysis and synthesis. Detailed research and generalizing survey are not antithetical but complementary. For a long time, however, the specialist has reigned supreme in our schools. The need is now, surely, for a return to synoptic writing. The present work was undertaken to supply the need of a synthesis. It is a map of a large region, not a geological chart of a square mile, or the plan of a single city. Its value, if any, lies in its view of the interrelations of large tracts of social and intellectual life, not in the intensive investigation of narrow fields.

Conscious of the need of supplementing my own arduous labors in diverse fields, I have been able to obtain the advice and criticism of several eminent specialists. The second chapter, on Newtonian Science, has been read by Professor Frederick A. Saunders, of Harvard; the third and fourth chapters, on Science, have been read by Dr. W. T. M. Forbes, of Cornell; the fifth chapter, on Philosophy, by Professor Charles H. Toll, of Amherst College; the sixth chapter, on Political Theory, by Professor G. E. G. Catlin, of Cornell; the ninth chapter, on the Modern Prose Style, by Professor Robert P. Sibley, of Cornell; the tenth chapter, on Poetry and Drama, by my sister, Professor Winifred Smith, of Vassar College; and the eleventh chapter, on the Spread of the Enlightenment, by the late Professor Othon G. Guerlac, of Cornell. While thanking these friends for valuable services, I must add an expression of my grief and sense of loss in the death of Guerlac, early in 1933. The keenness and delicacy of his criticism proved not less instructive than his generous enthusiasm was encouraging and rewarding to my modest efforts. Most of all I am indebted to my wife, who has read the whole manuscript and the proof. Mr. Henry H. King has prepared the index.

P. S.

*Cornell University,
December 19, 1933.*

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A HISTORY OF MODERN CULTURE

CHAPTER I

THE BACKGROUND AND THE CHARACTER OF THE ENLIGHTENMENT

I. POLITICAL HISTORY OF THE PERIOD 1687 TO 1776

After the Great Renewal came the Enlightenment; after the Age of Science the Age of Reason. Doubtless the growing confidence in the powers of the human understanding, the enthronement of reason on the seat once held by authority and tradition, the conquest by science of politics, philosophy, and theology, the triumph of reason over superstition, intolerance, and despotism, the education of the masses in the new world-view, and the final decline of rationalism before the assault of neglected emotions and under the solvent of self-critical analysis and subjectivism—doubtless all this is the supremely important revolution of the eighteenth century. As the story of this intellectual revolution will fill the pages of the present volume, a few words are necessary to introduce the reader to the stage on which was enacted this great drama of the human spirit.

The theater was that portion of the world inhabited by the white race, that is, Western Europe now including Russia, and the ever expanding territories colonized by Europeans in the Americas. As the chronological limits of the age are clearly marked in the intellectual field by the seminal works of Newton and Locke at its beginning, and by the incursions of the idealistic philosophers and of the romantic poets at its end, so the boundaries of the political epoch are conveniently delimited by events which happened in the ninth decade of the seventeenth century and in the eighth decade of the eighteenth.

The Revocation of the Edict of Nantes (1685) not only

proved to be the last act of wholesale intolerance but also marked the beginning of the end of the French hegemony. On the other side of the Channel the English Revolution of 1688-89 marked the beginning of the most glorious epoch of English liberty and of British dominion. Both in material and in spiritual matters the British Empire led the van of progress. The consolidation of the Austro-Hungarian dominions (1687), the entrance of Russia into Western civilization (1689) and her rise to the rank of a Great Power (1721), the rise of Brandenburg and her transformation into the Kingdom of Prussia (1701), and the transfer of Spain from the Hapsburgs to the Bourbons (1700) marked the beginning of an epoch which came to an end with the dissolution of the British Empire, with the American and French Revolutions, and with the industrial crisis in the eighth and ninth decades of the eighteenth century.

The changes in the political structure of Europe and America were partly accomplished by a series of long wars. The struggle of France and England for colonial empire and for the hegemony of the world, the conflict of Austria and Prussia for the leadership of Central Europe, and the strife of Russia with her neighbors for the domination of Eastern Europe, became connected by national alliances and coalitions, and finally culminated in that universal *mêlée* known as the Seven Years' War (1756-63). The final results of these battles were the expansion and consolidation of the British Empire, of Prussia, and of Russia, at the expense of considerable loss of territory and prestige by France, the Netherlands, Austria, Poland, and Sweden.

Not less important than the transfer of wealth and power from one nation to another was the shifting relation of the different classes within each state. Modern times have seen the gradual growth of democracy in the assertion of political leadership by ever larger, and lower, classes. The late seventeenth century, and the eighteenth, even before the great revolutions at its end, saw important steps taken in this direction. Throughout the period of the Enlightenment the older privileged classes lost ground to the Third Estate,

or bourgeoisie. The establishment of parliamentary supremacy in Great Britain and in Sweden, the growth of popular government in the North American colonies, the continuation of a republican polity in the Netherlands, the rule of the wealthy burgher class in the growing Free Cities of Germany and of Switzerland, all enlarged the basis of political power within the state, even though all shunned the logical conclusion of the process in universal democracy. In the remaining countries of Europe the same cause produced the benevolent despotism which, while it still denied the people a share in the government, recognized the supreme obligation of the state to promote the prosperity and happiness of its inhabitants.

The rise and fall of nations and of classes can no longer be regarded as anomalous phenomena, to be explained only by the spontaneous efflorescence of individual genius and of national will, or to be left unexplained as the result of chance or of inscrutable destiny. All political changes are the results, or, rather, the superficial indications, of the interplay of deeper social, economic, and intellectual changes. All these, in turn, may be referred to scientific or technical inventions by which that intelligent animal, man, adjusts himself to his environment so as to secure the maximum chance of survival for his species and his group. The political and economic changes of the eighteenth century were due to the expansion of commerce and industry under the stimulus of technical improvements, and to the continued cheapening of knowledge, which is proverbially power, by the development of the printing press. Both of these causes of change had been in operation for two and a half centuries before the era of the Enlightenment; both of them continued to operate after its close.

It is now known to economists that the terms "commercial revolution" and "industrial revolution," once in common use, give a wrong impression of the historical changes in the production of wealth, as if it consisted in two epochs of sudden advance, one in the early sixteenth century and one in the late eighteenth, with a long period of stagnation be-

tween. What really happened in the economic world was not intermittent progress, with sharply defined periods of rapid and slow change, but an uninterrupted improvement in the means of producing wealth, and a great crescendo in its volume, beginning in the late Middle Ages and continuing to the present. This was due to technical improvements in industry and to the increasing ease of commercial intercourse. The process of smelting iron by pit coal, discovered in the reign of James I by a natural son of Lord Dudley, but not widely used until it was revived by Darby of Colebrook in 1735; the invention of the fly-shuttle by John Kay in 1738, and of the spinning-jenny by the Hargreaves in 1764; the improvement of the process of spinning by rollers invented by John Wyatt or Lewis Paul; the perfection of the process of milling silk by Jubié in France—all these are but a few samples of the many discoveries which, in this period, added to the product of industry. At the same time the digging of canals and the building of roads revolutionized land commerce, while the exploration of the globe and the exploitation of new lands added immensely to the volume of maritime traffic.

The general result of the operation of the economic forces just described was to throw wealth and dominion to the sea powers at the expense of the land powers, to favor the Atlantic nations at the cost of the Mediterranean states, and of the Northern European peoples more than of the Southern, and to expand the world of European culture. Within each state the class commanding commercial and industrial wealth gradually assumed the dominating position once held by the landed and military aristocracy and by the landed and spiritual hierarchy of the church.

No nation profited so much by the action of these forces as did Great Britain. The outward-bound tonnage of English trade amounted in 1700 to only 317,000; this increased to 661,000 tons in 1751 and to 959,000 tons in 1783. The symbol and the fortress of the rising money-power was the Bank of England, chartered in 1694, and soon acquiring an influence which, constantly exercised on the side of the

Whigs, almost counterbalanced the weight of the church on the side of the Tories. The Union of England and Scotland, which had been merely dynastic since the accession of James I, was perfected by the amalgamation of the Parliaments in 1707. The growth of empire in America and in India greatly augmented the power of the state.

The same period which saw the growth of the First British Empire to its maximum, also witnessed the establishment of constitutional, parliamentary government. The Revolution of 1688-89 transferred the crown from James II to William and Mary, and insured the liberties of the subject and the right of Parliament to make laws, to levy taxes, and to provide for the army. The control of the executive by Parliament was secured by the noiseless revolution, accomplished in the years 1693-96, in the appointment of ministers of the Crown, who could not henceforth perform their functions without the confidence of the party in control of the House of Commons.

Not less striking than the growth of English empire and liberty was the prestige of English thought. As Italy had led Europe in the Renaissance, as Germany had guided the Reformation, as France had dominated the age of the Great Renewal, so England kindled the Enlightenment. Envy of the British Empire and admiration for the British constitution were not more general throughout this period than was the acceptance of British science, philosophy, and religion. While Newton, Locke, and the English Deists reigned over the international Republic of Letters, London became its metropolis. To the spiritual, as to the material, strength of Britain Scotland contributed not a little. The eighteenth century was for the northern kingdom an era of great prosperity, and was also the era in which Scots made their largest contribution to the world of culture, speculative and practical alike.

The resources of the British Empire, cultural as well as economic, were vastly increased during this era by the American colonies. The total population of the twelve continental colonies in 1689 of about 200,000 increased in the

thirteen colonies (the thirteenth being Georgia, settled in 1733) by 1760 to 1,300,000 whites and 300,000 negroes. At a time when the population of the British Isles did not exceed nine millions, this made of America a respectable portion of the Empire, as it was by far the most rapidly growing portion. While foreign accounts celebrated the marvelous growth of the colonies, the inhabitants began to cherish a sense of pride in achievement and to feel their strength. The wars between Britain and France, in which the colonists of both countries participated, redounded greatly to the security and advantage of the British settlements by the conquest of Canada and of the French posts west of the Allegheny Mountains.

As in England, so in America the late seventeenth and the eighteenth century saw a remarkable growth of constitutional liberty. As the proprietary, or feudal, colonies became Royal Provinces, the British government began to pay more attention to ruling them. As the settlements were exploited by the Mother Country for her own gain, the divergence of interests of Britain and America became apparent, and was reflected in the constant struggle of the executives, in most colonies appointed by the crown, and the legislative assemblies elected by the people. While parliaments were sinking into decay on the continent of Europe, this efflorescence of popular representative institutions in America constituted an event of immense importance in the history of the world. Moreover, though the franchise was limited by property and religious qualifications, and though some portions of the population, as slaves and as indentured servants, enjoyed scant civil rights, the Americans developed the most democratic society then existing in the world.

Prior to 1689 the white population of the colonies had been chiefly English, with small ingredients of Dutch and of Swedish extraction. Large immigration of French Huguenots, of Scotch and Scotch-Irish, and of Germans began that mixture of stocks destined to form the new American race. Geographical propinquity, the common warfare

against French and Indians, the assertion of a common interest against the British rule, and even the efforts of the London government to unite the colonies, all contributed to a growing sense of union which was destined shortly to culminate in the birth of a new nation.

The state of culture in the colonies was high. If the arduous life of the frontier left little time or energy for the cultivation of the amenities of life, the older cities—Boston, New York, and Philadelphia—produced as cultured a society as did any provincial English city. That America had no castles was reckoned as a political advantage by Goethe and as a cultural lack by Ruskin. But if she had inherited none of the monuments of architecture or of other arts from a remote past, she established schools and universities as good as those of the old country, and frequented by a much larger proportion of the population, and she eagerly bought and read the best books produced by Europe. Nor was she unable to add to the common stock of ideas. In Jonathan Edwards she produced one of the profoundest religious philosophers, and in Benjamin Franklin one of the greatest of the illuminati of the century.

Analagous to the expansion of European civilization westward was the eastward sweep by which Russia was brought into its circle. While the older Muscovy had been rather Asiatic than European in its barbarism, when transformed into the Empire of all the Russias, in 1721, it became one of the Great Powers, and a member of the cultural group of the Occident. The general causes making this necessary were the improvement in means of communication and in the diffusion of ideas; the instrument by which it was accomplished was the Czar Peter the Great (1682-1725). The vast increase of Russia's material powers, begun under him and continued under the able rule of Catherine II (1762-96) expanded her borders at the expense of Sweden, Poland, and Turkey, and definitely fixed her boundaries not far from the Amur River in the Far East. Administrative reforms, the creation of a bureaucracy, the breaking of the power of the nobles and of the church, the fostering

of the middle class of the towns, were accompanied by economic and social changes of even greater importance. Peter the Great set his subjects an example by completing his education in the shipyards and factories as well as in the courts of England and of the Netherlands. After his return in 1689 he earnestly labored to introduce western technical methods and western fashions among his people. Sending young nobles abroad, and importing foreign artisans, he revolutionized at least the external framework and material basis of Russian civilization. Only under Catherine II did the intellectual life of Russia plunge into the full current of the Enlightenment.

As the rise of one people is often achieved at the expense of another, the expansion of Russia involved the decline of her neighbors. Poland, surrounded by more powerful states, suffered the most. Under the rule of the Saxon dynasty, which ascended her throne in 1697, she steadily lost ground to Russia, Prussia, and Austria even before the first partition, by which she was deprived of one-third of her territory in 1772. Internal strife, political and religious, exhausted her strength still further.

Sweden, too, sank under the attack of warlike neighbors. Notwithstanding the military genius of Charles XII her Baltic empire crumbled under the Russian pressure. During half a century, however, she enjoyed a parliamentary government somewhat similar to that of England. A disputed succession in 1720 allowed her diet, or Riksdag, to establish a new and highly popular constitution, in which the king retained little of his former power and became scarcely more than the president of the council, or cabinet, which was dependent on the representatives of the people. The four estates—nobles, clergy, bourgeoisie and peasants—ruled Sweden for fifty-two years under this fundamental law, which came to an end when Gustavus III in 1772 by a *coup d'état* and with the approval of public opinion, restored absolute rule.

Under the impact of economic forces the political structure of Germany was wholly transformed. Unable to achieve

national union, the German people lived in that loose confederation known as the Holy Roman Empire. Among the practically autonomous states in this body, Austria had hitherto been the greatest, and the southern states generally had been the seats of culture. But the industrial and commercial evolution now threw the weight of power, and as a consequence the leadership in culture, to the northern states. While the seaports, and especially Hamburg, benefited by the growing oceanic trade, the states of the great northern plain profited no less by the improvement of internal communications and by the expansion of the market to the eastward consequent upon the rise of Russia. The rulers of the three leading states in the north all became kings: the electors of Saxony were crowned kings of Poland (1697-1763); the electors of Hanover sat on the throne of Great Britain from 1714 to 1837, and the electors of Brandenburg made themselves kings of Prussia in 1701. The rise of this last-named state first to the hegemony of the Empire and then to the position of one of the great powers of Europe, was achieved by a series of wars with Austria, France, and Russia carried on by Frederick the Great (1740-86). The growth of the new state, however, is to be attributed less to the military genius of her king than to the improvement of her canals and roads, and to the growth of her commerce and industry. Her territory, though infertile, is large and unified, and peculiarly amenable to improvement. A very slight correction of her waterways made of her rivers and canals important arteries of trade.

For their lost hegemony in Germany the Hapsburgs compensated themselves by consolidating under their dominion the states to the south and east, and by expansion at the cost of Poland and Turkey. In 1687 the Estates of Hungary renounced their right of electing their monarch, and accepted the Hapsburg dynasty as hereditary. By similar action of the other states under the Austrian rule, and by the Pragmatic Sanction of 1722-23, which forbade the secession of any state, was formed that indissoluble union known for two centuries as Austria-Hungary.

In the late seventeenth century all the German states, big and little, became despotic. The nobles actively seconded and the masses passively acquiesced in the claims of the state to unlimited control over its citizens. The serene grand dukes and most serene electors puffed themselves, like the frog in the fable, to imitate the bull at Versailles. Their courts, furnished with French fashions and veneered with French culture, caricatured the etiquette of Louis XIV. The most amiable affectation of these rulers, from Frederick the Great down to the most insignificant landgrave, was that of enlightened care for their people's interests. After they had built showy palaces, stocked their parks with game, their cellars with wines, their bedrooms with mistresses, and their audience chambers with flunkies, they devoted what leisure was left them from an arduous life of pomp and pleasure to promoting the prosperity of their realms, to fostering trade, to repressing religious strife, and to cultivating art and letters.

While the courts, particularly those of Berlin and of Hanover, imported a good deal of French culture, some of the cities developed a more vital and indigenous intellectual life. Hamburg, favored by the influx of commercial wealth, by a free government, and by an ancient tradition of civic life, cultivated music and literature with noted success. During the eighteenth century she was surpassed only by Leipzig, the seat of a great fair. This fair provided the chief market in central Europe for books and for many other articles, and also attracted vast crowds to its exhibition of exotic wonders, or rich wares, and of more popular attractions, such as monsters, mountebanks, monkeys, and magic lanterns. The market held every spring gave Leipzig the primacy in the publishing and printing trades which she has held to this day. Societies and clubs fostered intellectual intercourse, while the theater, the opera, and chamber music were diligently cultivated by the public at large.

Switzerland, first recognized as an independent nation by the Treaty of Westphalia (1648), made it her necessary

task throughout the eighteenth century to resist the encroachments of France. Internally a strain continued to exist between the Protestant and Catholic cantons. Political power, in the hands of an oligarchy of wealthy burghers, became, on the whole, narrower and less liberal throughout the period.

Ground between the millstones of the French army and the English navy, the Netherlands no longer maintained their political importance in the eighteenth century. The accession of their stadtholder William III to the English throne bound them to the coalition against Louis XIV. After William's death in 1702, the government became an aristocratic republic until, in 1747-48, a counter-revolution in favor of William IV changed the constitution in a monarchical direction. With the decline of wealth and of prestige went a decline of Dutch culture. After the death of Ruisdael (1681) and of Huygens (1695) the Netherlands ceased to contribute largely to art or to science. In fashions, in thought, in literature, she became a province of France.

During the last thirty years of his reign (1685-1715) Louis XIV strained the resources of France beyond her strength in order to maintain the glory of his monarchy. Terrible wars, the ruin of the Huguenots, unwise government regulation of industry, trade and agriculture, and oppressive taxes, combined to reduce the population of France from about nineteen to about eighteen millions during this single generation, and to bring both the people and the government to the verge of bankruptcy. What vestiges of liberty had been left the French by 1685 had almost disappeared by 1715. The government became more and more despotic and more and more ingenious in extracting wealth from an exhausted people. Some compensation, however, was found for the loss of blood and of treasure, in the glory won by the House of Bourbon when a grandson of Louis was seated on the throne of Spain.

During the long reign of Louis XV (1715-74) the French people recovered a considerable degree of prosperity but lost their colonies in India, the West Indies, and Canada to

England and their preponderance in Europe to Prussia. After 1750 the policy of extreme government regulation of industry, known as "Colbertism" relaxed under the protests of industrialists and economists of the physiocratic school. While the peasants and lower classes profited little by this, the merchants began again to accumulate wealth. Taxation and finance were better managed than they had been in the previous reign. Roads, built and maintained by the *corvée*, ministered to the general prosperity while adding a new burden of forced labor to those already borne by the unfortunate peasants.

The final step in making the monarchy autocratic was taken by the suppression of the Parlement of Paris and of the local Parlements by a *coup d'état* in 1771. While these courts of law had been in no sense popular or representative bodies, they had constituted a slight barrier between the people and the encroachments of illegal despotism. Nevertheless, as they had become seats of aristocratic privilege, of provincialism, and of bigotry, their suppression was approved by public opinion.

With all the blows to her greatness administered by foreign states and by blind rulers, France remained the second power in the world of politics and in the world of letters. Her intellectuals were inferior to those of England alone in the creation of new thought, and inferior to none in its distribution.

The decadence of the other Latin countries, begun in the seventeenth century, continued throughout the eighteenth. After the golden age of Velasquez and Cervantes, of Calderón and Murillo, Spain became for a long time a negligible factor in European civilization. While the Spanish Bourbons (1700 ff.) restored some slight degree of prosperity to the people, they made the country politically a satellite of France. While aiming, in the spirit of "enlightened despotism" to work for the people, the kings refused them the slightest share in self-government. Summoning the Cortes of Castile and the other provinces seldom and reluctantly, they governed by a centralized bureaucracy. Even the

church was subjected to the state in the concordats of 1737 and 1753 and by the decrees of 1761 and 1762 forbidding the publication of papal bulls without royal license. The colonies remained a source of strength and of pride to the Spanish race. Their civilization, inherited from the mother country, was hardly inferior to that of Europe. In neither Spain nor her colonies, however, did the new thought find much acceptance.

As Spain was swept into the wake of French policy, Portugal became, by the treaty of 1703, practically a dependency of England. The chief source of her wealth was the colony of Brazil. The discovery of gold mines there in 1693 enriched the crown to such an extent that the kings were able to govern without calling the Cortes after 1697. The American money, squandered on royal luxury, on the church, and on war, did not proportionately enrich the people. The awful catastrophe of the earthquake which in 1755 destroyed Lisbon and killed about 30,000 of her inhabitants, made a tremendous impression upon the mind of the civilized world.

The sun of the Renaissance having long set, twilight fell on the Italian mind after the middle of the seventeenth century. Spiritual and temporal oppression completed the ruin wrought by foreign dominion and by economic decay. The Italians still continued to enjoy the art, the literature, and even the science created by their ancestors, but they were unable, with a few brilliant exceptions, to create anything new. Rome and Florence, rich with the spoils of earlier ages, became shrines for the foreign seekers of esthetic pleasure, and the homes of native dilettanti.

In addition to the general causes of Italian decadence, special forces depressed the Papacy to the nadir of her historical orbit. As the capital of Catholic Christendom she suffered from the prevalent hostility to the church. To her old enemies—Jansenism, Gallicanism, and state absolutism—was now added a fourth in the rise of rationalism. What successes were won by the popes in this era were due not to their own strength but to the mutual jealousies of the

great powers. Innocent XII brought the Gallican strife with Louis XIV to a conclusion favorable to himself not because of his spiritual power, but because Louis was beset by a coalition of enemies, mostly Protestant. When Clement XIII tried to use the interdict against France, Spain, Portugal, and Naples, he found that once potent weapon more dangerous to himself than to his enemies. Finally, the popes sought to make the best of a hard situation by conciliating the favor of the princes. Benedict XIV (1740-58), conscious of his impotence to stem the tide of change and disintegration, tried by ample concessions in temporal matters to make of the kings of the earth allies against the seceding intellectuals and the insubordinate episcopate. Such concessions, however, while enraging the clericals, only served to convince the enemies of the church of her impotence and to urge them to ever fresh efforts. Attacks were made easier by the flagrant bribery, speculation, and trafficking in spiritual wares by which the popes evinced their unworthiness to give an edifying example to the church and their inability to govern justly their own small temporal state.

The Kingdom of Naples, the Grand Duchy of Tuscany, and the Republic of Venice, though nominally independent states, were used as pawns by the great powers in the game of politics. The extinction of the House of Medici in 1737 left the Grand Ducal throne of Tuscany to Francis Stephen, Duke of Lorraine and Bar, who ruled as Francesco II. While in foreign politics he and his successors followed the lead of the Hapsburgs, in domestic rule they were able to curb the pretensions of the church, to build good roads, to foster commerce and industry, and to allow their subjects to enjoy the pleasures of art and literature.

2. CHARACTER OF THE ENLIGHTENMENT

Such was the political geography of the most civilized portion of the earth at the time of that vast spiritual revolution long known to the Germans as the *Aufklärung*, sometimes

called by English writers the Illumination, and now coming to be known as the Enlightenment. So well marked an epoch of so momentous a movement cries out for a distinguishing name no less than do the Renaissance and Reformation, for, like each of these revolutions, it saw a new world-view, established a new intellectual order, and transvaluated the hitherto received standards of the race. In some respects it can be compared to the other great spiritual revolutions of history. Like the Greek sophists, the "philosophers" of the Enlightenment found in the comparison of their own standards with those of other races and in the mutual contradictions of the wise, reason for doubting the validity of the accepted religious and ethical systems. Like the humanists of the Renaissance they turned eagerly from an other-worldly and pessimistic, to a secular and optimistic mood. Like the Reformers they appealed to the masses to overthrow the traditional and authoritative by the exercise of the right of private judgment. Like the revolutionists of the succeeding age, they emancipated mankind from many of the shackles of irrational abuse and of hoary despotism.

The Enlightenment, however, differed in character from all previous and from all subsequent revolutions. Whereas the outcome of the labors of the Greek sophists, beginning with Socrates, had been a universal skepticism, the aim of the illuminati was to set up a new standard of truth—which standard they found in science. If the humanists of the Renaissance had appealed, in their revolt from medievalism and scholasticism, from the authority of the church to the authority of the classics, the illuminati of the eighteenth century appealed from all written authority to the findings of reason. If the Reformers had attacked the church in the name of religion, and had subjected her traditions to the criticism of their private judgment, they nevertheless set the measure of absolute, revealed truth in the Bible; the leaders of the Enlightenment found the fulcrum for subverting existing institutions and standards only in the laws of nature, discovered, as they supposed, by mathematicians and astron-

omers. Even more profound was the difference between the Enlightenment and all subsequent revolutions. From the publication of Christianity to the end of the eighteenth century all ages believed in the existence of absolute truth; they only differed in the choice of their authority. The schoolmen found in Aristotle and in the Fathers of the church their criterion of intellectual and moral values; the humanists discovered it in the writings of the Roman poets and orators; the Reformers in the Bible; the philosophers of the Enlightenment in science. But, beginning with the latter part of the eighteenth century, many men have begun to doubt the very existence of any absolute standard either of logical truth, or of moral conduct, or of esthetic judgment. Even the most sturdy individualists of the sixteenth, seventeenth, and eighteenth centuries believed in an objective measure of all these things; but the intellectuals of the nineteenth and twentieth centuries, having become increasingly subjective in judgment, no longer dare to assert the universal validity or rationality of any proposition, even in science.

The rationalism of the Enlightenment was, in some respects, a link with the past rather than with the future. It is no mere paradox to compare the philosophers of the eighteenth century with the schoolmen of the thirteenth. Aquinas and Locke, St. Vincent de Beauvais and Voltaire, all thought of the world as a comprehensible unit, to be fitted into a rational scheme. But "the essential quality of modern opinion is factual rather than rational. . . . The trend of modern thought is away from an overdone rationalization of the facts to a more careful and disinterested examination of the facts themselves."¹

In other words, the implications of the new knowledge of the world and of man were not at once grasped. Science merely replaced revelation as a standard to which to appeal. The philosophers retained the absolute; the Deists clung to God; the moralists felt the compulsions of the an-

¹ C. L. Becker: *The Heavenly City of the Eighteenth-Century Philosophers*, 1932, 19.

cient virtues. But the corrosion of the new knowledge had begun. Gradually, and almost unperceived, science took the place of philosophy, and history (a sort of anthropology, or man-lore) that of theology (God-lore).

The distinguishing character of the Enlightenment was, then, the prevalent confidence in reason. It was the Age of Reason, the age in which the human understanding enjoyed a higher authority than it has ever enjoyed before or since. Boileau's precept for cultivating literary style might stand as the motto of the era:

Aimez donc la raison! Que toujours vos écrits
Empruntent d'elle seule et leur lustre et leur prix!

"Consult your reason betimes," wrote Lord Chesterfield to his son, "I do not say that it will always prove an unerring guide, for human reason is not infallible, but it will prove the least erring guide that you can follow."

An economic and social cause of the triumph of reason over tradition at this epoch may be found in the evolution of the intellectual class to a dominant position in the state. The older privileged classes continued to appeal to the ancient authorities: the priest to the oracles of his religion, the noble to the law, the ruler to the army, and all to custom. The intellectual had but one weapon—his wits. Naturally he exalted the authority to which he could appeal, the standard of common sense and of logic. Moreover the intellectual class at this time, in its widest sense, coincided with the upper middle class, with sufficient means to buy books, sufficient taste to enjoy them, and sufficient leisure to think a little about them. The masses were still excluded from participation in the spiritual, as they were disinherited from the material, riches of society. With them, too strenuously engaged in the struggle for a livelihood to devote much time or strength to thought, the emotions rather than the intellect have always supplied the criterion of value. Modern times, since the end of the eighteenth century, have been increasingly irrational partly because they have been increasingly democratic. The Middle Ages were authorita-

tive partly because the privileges of the ruling classes depended largely upon the force of custom and tradition. But the Enlightenment, between the two ages, brought to leadership just that literate public whose claims could be vindicated only by an appeal to reason and common sense. Then reigned a sort of graphocracy, or rule of writers, in which even revelation dissolved in criticism and in which even despotism was tempered by epigram.

It would be wrong, however, to attribute the peculiar rationalism of the eighteenth century wholly, or even chiefly, to an economic cause. The mentality of a given epoch is conditioned not only by the soil of material institutions from which it grows, but by the climate of intellectual atmosphere in which it lives. This intellectual atmosphere is the world-view held by the dominant classes. The world-view of the Enlightenment was partly inherited from earlier centuries, and was partly reshaped by the new science. Inheriting from their ancestors the belief in absolute truth and in a reasonable and comprehensible universe, the philosophers of the Enlightenment found a new standard of truth in science, and a new scheme of the universe in the astronomy of the seventeenth century. Newton's discovery of the law of gravitation seemed to offer a simple mathematical formula usable as a pattern for thought in every field. From natural science the new pattern was adopted in other fields of thought. History furnished a new knowledge of human nature which, it was felt, must be as much subject to scientific law as was inanimate nature. Gradually, institutions, politics, religion, education, psychology, and esthetics, were subjected to the yoke of physics, were assumed to be amenable to natural law, and were investigated, criticized, explained, and reformed, accordingly.

The establishment of the scientific method as the key to discovery in all the fields of thought did not satisfy the exponents of the new world-view. These zealots aimed at nothing less than the transformation of society in obedience to the dictates of reason, and, as a means to this, at nothing less than the conversion of all thinking men to their prin-

ciples. The Enlightenment resembled a new religion, of which Reason was God, Newton's *Principia* the Bible, and Voltaire the prophet. He and his comrades, the *philosophes*, by books and pamphlets, by vast encyclopedias and by tiny newspapers and journals, by a new prose and a new poetry, by serious argument and by witty mockery, conducted a vast propaganda among all civilized nations.

The chief article in the creed of the new religion was faith in Reason, as the omnipotent and autonomous arbiter of all things. The rationalists of that time not only regarded the supremacy of reason as self-evident, but they regarded it as an immensely useful doctrine and as an entirely new one. The Renaissance and the Reformation, it was felt, had failed to procure a thorough renovation of society because they had no new criterion to which to appeal. Humanists and Reformers had played off one authority against another, one part of a system against another part. This is an excellent destructive method—so excellent that it often proved suicidal in the hands of those who applied it; but as a constructive method it is impotent. Now at last, it was thought, men had found in reason a guide superior to all traditional authority, and a guide both potent and beneficent.

The principle of the Enlightenment was intellectualistic. Knowledge passed for the greatest of the powers of the mind. Knowledge, it was thought, would not only unlock the secrets of nature, but would insure virtue and teach the correct rules for creating poetry and art.

Secondly, the spirit of the Enlightenment was practical and utilitarian. It sought to promote the happiness of the people by remodeling institutions. It justified poetry and religion by finding profit in them. In fact, by this method it missed the highest values of emotion which are self-justified; sentiment was groomed into sentimentality.

Thirdly, the Enlightenment was optimistic, fully convinced of the intrinsic goodness of mankind, and of man's ability to win happiness. This optimism was due partly to the exaltation following on the discovery of a new principle, pregnant with a gospel for the world. Kant's definition of

the Enlightenment as the exit of mankind from the tutelage of a minor exactly expressed the self-confidence of the new spirit.

As this spirit arose in the field of natural science, it was in that field that it first attained maturity. Far from watching science with suspicion, hostility, and dread, the men of that time came mostly to welcome its discoveries with enthusiasm. A reckless search for truth was demanded; the methods of experiment and of mathematical analysis were justified by their success. No longer could scholastic tradition, the authority of the state, or even the sanctity of revelation be successfully pleaded as a bar to the acceptance of scientifically established truths.

From this field the method was transferred to that of the social sciences. Perhaps the most characteristic achievement of the thinkers of the eighteenth century was the establishment of the natural system of the moral and social disciplines. These men were convinced that jurisprudence, religion, and morality were no less subject to fixed formulæ than were astronomy and physics. The idea of a natural law, a natural ethics, and a natural religion, found in germ much earlier, now became dominant. Convinced as they were of the unchangeableness of human nature, the historians of this period failed to allow sufficiently for the peculiarities of former ages. In other fields, while their fundamental axiom was correct, the thinkers of that age sometimes erred through too hasty generalization. But on the whole they did a work wonderful both in its newness and in its permanent value.

When they came to study existing institutions and customs, the *philosophes* became active reformers. First of all they demanded freedom of thought and expression, without which truth would be handicapped in her struggle with power. Secondly, they declared war on the irrational, especially as found in religion and in superstition. No achievement of that period has contributed so much to human happiness as its conquest of credulity and cruelty as manifested in the Inquisition and in the witch-hunt. Thirdly, they de-

manded and partly secured a reform of the laws in the direction of kindness. Abhorring the hard and the horrible as equally repugnant to the head and to the heart, they first began to relax the savage persecution of the delinquent and of the debtor. In politics and economics their influence, while beneficent, was far from radical or revolutionary. Despotism, if educated, seemed to most of them justified by its efficiency in promoting the reforms they had at heart, and democracy condemned by its lack of experience and by its alleged lack of judgment and of self-control. There were, however, some democrats and revolutionaries before the age of the American and French Revolutions. And in other respects the spirit of the Enlightenment, as cosmopolitan as was its mother, Science, made for peace, for free commercial intercourse, and for administrative reform. Politics were secularized as well as humanized.

Morals also were secularized. Ethics were no longer deduced from the will of God but were derived from the nature of man. The idea of original sin was given up. Virtue was called its own reward.

Though they devoted themselves zealously to education, the illuminati accomplished more in the schools than in the universities. They broadened education, made it more practical for the worker and more modern for the gentleman.

Deeply convinced of the principles of natural religion, many of the *philosophes* became involved in a war with Christianity which has attracted more attention than their positive efforts to found a rational cult in Deism. While their indignation was aroused by the intolerance of the churches, and by the claims of each to be the exclusive purveyor of salvation, their contempt was excited by the base alloy of credulity mixed in the precious metal of rational belief. Revelation was rejected, miracles were ridiculed, the sacraments were ignored, and dogma was drastically reduced. The church was no longer regarded as a divine creation, but each church was held to be a voluntary society of like-minded men.

Into art, into literature, and even into music the thinkers of the eighteenth century tried to introduce the principles of order and of natural law. In the search for comfort and for pleasure, architecture gave ground before interior decoration and painting became either ornamental, or voluptuous, or moralistic. Perspicuity became the queen of literary virtues; clarity, neatness, wit, readability, were cultivated at the expense of eloquence, emotion, and profundity. Poetry declined the dangerous ardors of the sublime to cultivate the pretty graces of the drawing-room.

And what a drawing-room! Even a sketch of the Enlightenment must note that its spirit permeated good society. The curled wigs of the men and the powdered hair of the women were not more formal than the manners; the gay colors and various cuts of the dress of both sexes were no more carefully studied and perfected than was the formality of conversational, or epistolary, intercourse. In wordly wisdom and deliberate reserve, in restrained emotions and in hot-house wit, in epigram and in repartee, the world of fashion then shone with unexampled lustre.

Every historical generalization is at best half true. Life is complex, rich, various, and changeful; our formulas for describing it are far too simple, meager, and rigid to do more than select a few salient angles for examination. What has just been said about the spirit of the Enlightenment must be accepted with infinite qualification, with perpetual reservation and exception, with imagination in filling in a background of contrasts, and with discrimination in the perception of the various shades and tints in the picture. No more than any other period was that of the Enlightenment all of one piece. The age of reason saw many outbreaks of hysteria. The age of optimism now and then fell into black despair. Humanitarians and slave-traders, Deists and Methodists, philosophers and inquisitors, moralists and mockers, flourished side by side. Voltaire was deified for writing the *Dictionnaire Philosophique* and La Barre was decapitated for reading it. Rousseau preached a sentimental religion and Dr. Johnson said he ought to be sentenced to

penal servitude for doing it. Pope wrote poetry like prose and Burke wrote prose like poetry. The code of politeness was elaborated to an unheard-of refinement by Lord Chesterfield, and the rudeness of Czar Peter and of Frederick William I of Prussia, exhibited genius in its magnitude. Jonathan Edwards based his ethics on hell fire and total depravity; Benjamin Franklin his on happiness and human goodness. Zinzendorf went into transports of ascetic dreaming, while Casanova gloried in the practice of monstrous libertinism. The most artificial society ever known read with rapture of the noble savage. A world full of misery for the masses applauded Leibniz for declaring that it was the best possible of worlds, and later applauded Voltaire for ridiculing this thesis.

Why multiply these antitheses? Many more will readily occur to every reader of this book. When we speak of the spirit of the time as rational, clear, optimistic, secular, modish, and mocking, we are describing not the spirit of the masses, or of certain backward groups, but the spirit of that particular group which, in the light of two centuries of study, seems to have contributed most of permanent value to the wisdom and beauty of the world, and to have labored most successfully for the advancement of civilization. Just as the history of music describes the works of the great masters of each age, disregarding the wretched tunes which, at any given time, are most popular with the vulgar, so a history of culture throws the creations of the choicer minds into the lighted foreground, leaving in the dim background the inert opinions of the masses, and in the half light of middle distance the discordant protests of active critics. Such a history is really always a history of the vanguard, and gives an impression that the age treated is more brightly illuminated than it is. The men whom we think of as typical of the time—Voltaire, Chesterfield, Casanova—shocked most of their contemporaries. Even the science of Newton was attacked as atheistic by Berkeley and by some other philosophers and divines, and remained unknown to the masses. The music of Bach then languished

unheard; the opera was sometimes suppressed by the censors of morals and often ridiculed by the arbiters of taste. Probably a very small proportion of the people then living ever saw a Sheraton chair or a Louis XV room.

And yet, with all necessary qualifications, there remains something of supreme importance in the age between Newton and Laplace, between Locke and Kant, between the English and the American Revolutions, something which can be disengaged from the mass of confused and discordant records and which can be felt as the authentic expression of contemporary culture. Varying as it did from country to country—in England cool and judicious, in France radical and destructive, in Germany conservative and popular, in America practical and democratic—the better thought of the time emerges with an individual, though complex, character, which marks it off from the thought of earlier and of later epochs. It was this spirit that gave all problems—those of science, of psychology, of history, of religion—a more modern form, that sowed the seeds of a still surviving rationalism, that made successful war on superstition and intolerance, that began a vast propaganda for the education of larger classes than had hitherto been admitted to participation in the world of thought and of culture, and that deservedly stamped its age with the name of the Enlightenment.

CHAPTER II

NEWTONIAN SCIENCE

I. ASTRONOMY FROM THE DEATH OF GALILEO TO THE PUBLICATION OF NEWTON'S "PRINCIPIA"

In the year that Galileo died (1642) there was born another astronomer and physicist destined to win even greater renown. The fame of Sir Isaac Newton is, indeed, as supreme and all but matchless in the realm of science as is that of Shakespeare in poetry and that of Napoleon in arms. The posthumous son of a small yeoman, he was born at Woolsthorpe, Lincolnshire, and grounded in the elements of religion and letters by his stepfather, a clergyman. Attending the King's School at Grantham, he mastered Latin so well as to become head boy, and to induce his family to send him to Cambridge University. While his four years at Trinity College (1661-65) gave him a mastery of mathematics and of polite learning and a considerable interest in ancient history and in theology, his real education—as is almost always the case with genius—was won by himself in extra-curricular studies. An acquaintance with an apothecary gave him an introduction to chemistry, and the reading of Kepler's *Optics* opened his mind to the wonders of physics. The acquisition of this book was the crucial date in his development. From the German scientist, whose influence over him can hardly be exaggerated, he obtained the starting-point for his investigations in all the three fields—astronomy, physics, and mathematics—to which he contributed so much.

With the characteristic precocity of genius he made his most important discoveries before he had reached the age of twenty-four. The law of gravitation, the principles of

the calculus, and the theory of light, all germinated in his mind as early as the year 1666. Except his precocity, however, nothing is more remarkable than his slowness in publication. Unwilling to put forth anything premature or incomplete, he spent years of arduous toil in testing and perfecting his ideas before he submitted them to the judgment of the public.

At the age of twenty-seven Newton was elected to the professorship at Cambridge which he held for twenty-six years, during which he made his vast contributions to science. With the coming of the Revolution in 1688 he began to take an active and distinguished part in public affairs. Having seen his university insulted and bullied by King James and by that evil tool of despotism, Lord Jeffreys, Newton welcomed the deposition of the tyrant and the establishment of liberty. Sitting in the Convention Parliament of 1689 and in the Parliament of 1701-02, he voted steadily as a Whig. Appointed Warden of the Mint in 1696 and Master of the Mint in 1699, his ability, industry, and uprightness carried through successfully one of the most difficult tasks ever laid upon the British treasury. For it was during the years of Newton's incumbency that England called in her clipped and debased coins and substituted for them honest money of full weight. Never did the scholar in politics acquit himself better than did Newton on this occasion.

Partly as a reward for his political services, but still more in recognition of his vast contributions to science, he was showered with honors. Though declining a pension from the French king, he accepted a membership in the *Académie des Sciences*, was elected President of the Royal Society in 1703, and was knighted in 1705. When he died in 1727 he was buried in Westminster Abbey, "like a king who had done great good to his subjects," said Voltaire.

Before describing Newton's astronomy, it will be proper to say something about the progress of the science from the time of Galileo to the publication of the *Principia*. During this half century, though there was no discovery of prime

importance, several useful observations were recorded, and a good deal of speculation took place on Kepler's laws, leading up to conjectural formulation of gravitational theories.

An English clergyman named Jeremiah Horrocks in a short life of twenty-two years (1619-41) predicted and observed the transit of Venus of 1639, thereby reducing the sun's parallax to nearly the correct figure. He also discovered the lunar inequality called evection and ascribed it rightly to the sun's influence, and he discovered the long inequality in the orbits of Jupiter and Saturn. These observations were first published in 1672.

Interesting observations, with a telescope improved by himself, were made by Huygens, during the years 1655 to 1690, partly from The Hague, partly from the new Parisian observatory, where he lived for four years. The first to see Saturn's ring in its true shape, he correctly described it as "thin, plane, nowhere attached, and inclined to the ecliptic."¹ He also saw Saturn's satellite Titan, the light and dark zones of Jupiter, the white poles of Mars, and the light and dark regions in the nebula Orion. The light spots he explained as "openings through which the brighter parts can be seen"—which agrees with the theory of modern astronomers that the dark spots are dark nebulae. His estimate, by comparing the light of Sirius with that of the sun, that the remote star was 27,664 times farther away than was the nearer, fell far short of the truth. Interesting, but unsubstantiated, are his speculations on the plants, animals, and men whom he conjectured to inhabit the planets.²

Cassini, the French Royal Astronomer, discovered the zodiacal light in 1669, and a little later calculated the distance of the sun as 87,000,000 miles—as against the modern calculation of a little less than 93,000,000.

Ever since Kepler had announced his laws of planetary motion and had proposed a theory of gravitation to account

¹ *Œuvres*, xv, 7; *Opera varia*, iii, 527.

² *Opera varia*, iii, 641. *Cosmotheoros*.

for them,³ many men had speculated on the force controlling the members of the solar system. A long step in the direction later taken by Newton was made by Robert Hooke (1635-1702), since 1662 curator of experiments for the Royal Society at London, since 1665 professor of geometry at Gresham College, and since 1677 secretary of the Royal Society. This versatile and omnivorous mind, whose work in microscopy is already known to readers of the present history,⁴ in 1665 sent a paper to the Royal Society suggesting that the earth's gravity varies with the height of the attracted body, and further that this difference in pull might be measured by a pendulum. In 1674 he published in the *Philosophical Transactions* "An Attempt to prove the Motion of the Earth from Observations." In this he proposes a "new system of the world," in which all mechanical motions may be explained on three suppositions:

First, That all Cœlestial Bodies whatsoever have an attraction of gravitating power towards their own Centers, whereby they attract not only their own parts, and keep them from flying from them, as we may observe the Earth to do, but that they do also attract all the other Cœlestial Bodies that are within the sphere of their activity; and consequently that not only the Sun and Moon have an influence upon the body and motion of the Earth, and the Earth upon them, but that planets also by their attractive powers have a considerable influence upon its motion as in the same manner the corresponding attractive power of the Earth hath a considerable influence upon every one of their motions also. The second supposition is this: That all bodies whatsoever that are put into a direct and simple motion, will so continue to move forward in a straight line, till they are by some other effectual powers deflected and bent into a Motion, describing a Circle, Ellipsis, or some other more compounded Curve Line. The third supposition is: That these attractive powers are so much the more powerful in operating, by how much the nearer the body wrought upon is to their own Centers. . . . It is a notion, which if fully prosecuted, as it ought to be, will mightily assist the Astronomer to reduce all the Cœlestial Motions to a certain rule,

³ *Ante*, vol. i, 30.

⁴ Vol. i, 129 f.

which I doubt will never be done true without it. He that understands the nature of the Circular Pendulum and Circular Motion, will easily understand the whole ground of this Principle, and will know where to find direction in Nature for the true stating thereof.

It is worth while to quote this passage to show both how near, and yet how far, was the author from the ideas later proved by Newton. In 1679 he wrote Newton that the force of gravity must vary inversely as the square of the distance. Five years later Edmund Halley made the further brilliant suggestion that the truth of this proposition could be deduced from Kepler's third law—"that the squares of the periodic times of the revolutions of the planets around the sun are proportional to the mean distances of the planets from the sun"—but he could not furnish the mathematical proof. To do this Newton was finally prevailed upon to publish the great work on which he had been meditating for twenty years.

2. NEWTON'S DISCOVERY OF THE LAW OF GRAVITATION

The delay in publication had been uncommonly long. For, as Newton himself tells us, it was in 1665 or 1666 that he first deduced—just as did Halley later—"from Kepler's rule of the periodic time of the planets . . . that the forces which keep the planets in their orbits must be reciprocally as the squares of their distances from the centers about which they revolve." Tradition, based on the good testimony of Voltaire, who had the story from Newton's niece, tells that the idea first flashed into the scientist's mind on seeing an apple fall to the ground from a tree in his garden at Woolsthorpe. Whether true or false this anecdote is an ætiological myth, such as have ever endeared themselves to human nature by attributing momentous events to some trivial, personal, and understandable cause. Such was the story of the fruit of the tree of knowledge of good and evil, though the effect on man's destiny of using the two apples

was very different. As Byron humorously put it, the apple of Woolsthorpe would seem to show

That Newton was the first man that could grapple
Since Adam with a fall or with an apple.

The long delay in publication was due to two or more causes. It is known that Newton started testing his law by measuring the force of attraction between the earth and the moon. But this could not be done accurately until the exact size of the earth was known, and this, again, was not accurately established until Picard's measurement of a degree on a meridian of longitude in 1670.⁵ It is true that before Picard, Richard Norwood, and perhaps Eratosthenes, had measured the degree with fair accuracy; but their estimates had been commonly discarded in favor of a figure much too small, until Picard established the facts. Another difficulty was that Newton was not sure how a sphere would attract a sphere—whether from center to center or in some other way. Only in 1685, apparently, he proved the theorem mathematically that the attraction would operate as though the whole mass of each sphere was concentrated at its center.⁶ It is probable that he felt some diffidence about other mathematical processes employed; and certain that he anticipated financial difficulties in the publication of so extensive a work on so abstruse a subject.

Finally, however, all difficulties were overcome—the mathematical by Newton and the financial by his friend Halley who, though not a rich man, generously offered to pay the cost of printing. The preface is dated May 8, 1686; the imprimatur was signed by Samuel Pepys, the diarist, then President of the Royal Society, on July 5, 1686. In 1687 the printing was completed and the work published in Latin under a title meaning: *The Mathematical Principles of Natural Philosophy*.

After a preface on scientific method, the author elaborates

⁵ *Ante*, vol. i, 117 f.

⁶ F. Cajori in *Sir Isaac Newton: A Bicentenary Evaluation*, 1928, 144; and in *Archivio di storia della scienza*, iii, 201 (1922).

definitions and axioms in an introductory section. Among the definitions the following are particularly noteworthy:

1. The quantity of matter arises from and is measured by a combination of its density and magnitude. 2. The quantity of force arises from and is measured by a combination of velocity and quantity of matter. 3. An inherent property of matter is the power of resistance by which any given body left to itself continues in the same state of rest or of moving uniformly in the same direction.

The axioms are the famous laws of motion, of which more will be said in another place.⁷

The first and second books then develop the intricate, and at that time new, mathematical processes for measuring the force exerted by bodies moving at different velocities and in constantly changing directions—as in a circle or ellipse. The third book expounds the system of the universe as it appears to the eye, summarizes the rudiments of astronomy, and explains the use of the telescope and microscope.

In the fourth book the author is again obliged to return to the first principles of science, or, as he calls it, of philosophy. Of these the most important, which are assumed as axioms, or laws of thought, may be summarized in the following words:

1. More causes of natural motions cannot be admitted than those which are proved and which are sufficient to explain the observed phenomena. 2. Therefore causes of the same nature shall be assigned as far as possible in explaining natural effects. 3. Qualities which can neither be increased nor diminished, and which exist in all bodies on which experiments can be made, shall be assumed to be qualities of all bodies.

The author then discusses the various heavenly bodies with a view to showing that they obey the law of inverse squares. Beginning with the satellites of Jupiter and of Saturn, proceeding with the motions of the planets, he ends with the moon, which furnishes the final conclusive proof.

⁷ *Infra*, p. 63.

Further theorems show that gravity exists in all bodies and is proportional to the quantity of matter in each body, and that "if the matter of two spheres attracting each other is homogeneous in all parts equally distant from their respective centers, the attraction of the spheres will be reciprocally as the square of the distance between their centers." In short, the great law was demonstrated: that two bodies attract each other directly as the product of their masses and inversely as the square of their distance.

Only less interesting than the proof of the main law are the numerous corollaries drawn from it. Newton shows that the rotation of the earth will flatten it slightly at the poles, and he shows further that this flattening will explain the precession of the equinoxes, a phenomenon known since the second century before Christ, but completely misunderstood until Newton. The observed phenomenon was that at each vernal equinox the sun slightly changed its position in the heavens, so that, in a period of 26,000 years, it was calculated, the sun would have revolved completely through the signs of the zodiac, and have returned to its original position. Newton showed that this was due to the torque exercised by the gravitational pull of the sun on the earth's axis. As the earth is not a perfect sphere, the center of the gravitational pull does not coincide with the center of the earth, but strikes the axis a little nearer one pole than the other. This gives the axis a little twist, making the pole revolve very slowly in a circle of large diameter. Newton also discusses and correctly explains the tides as due to the combined attraction of the sun and moon.

A brief and jejune outline can give no idea of the enormous richness of the work. Every page is crowded with a mass of new mathematics, physics, and astronomy such as has never been compressed into one volume before or since; and the cosmological picture is surrounded by a massive and luminous frame of philosophical comment on scientific method. The Latin style, while lucid and powerful, lacks all adornment to recommend it to the amateur of language.

No meretricious epithet, no emotional overtone, no sounding rhythm, no clever phrase for a moment either relieves or distracts the mind of the reader from the main thought. What made Newton a great master of style is the unequaled precision of his language. Not only in the *Principia* but in his short essays and in his familiar letters, there is the same amazing economy and the same perfect efficiency in the use of words. Whether he explained a childishly simple problem to Pepys, or a very abstruse experiment to Huygens, he set forth his definitions and conducted his argument without inserting a superfluous word or omitting a necessary one. This constitutes the "elegance" which Laplace commended in the *Principia*.

Even the mind of a Newton was somewhat hampered by the bonds of antiquity. The style of the *Principia* is deliberately archaic in two respects. In an age when many scientists wrote in their mother tongue, Newton preferred the universal language which could be read as easily by Huygens and Leibniz as by Hooke and Halley. Having already perfected the new calculus, and having used it in obtaining his results, he felt obliged to translate his mathematics back into the terms of the ancient geometry. Though this was perhaps necessary in order to make the processes comprehensible to the author's contemporaries, it has proved a burden to his successors. That accomplished mathematician, Augustus de Morgan, pronounces the *Principia* difficult to read because of the archaic form of its geometry.

Nor did the substance of Newton's work wholly escape criticism by his contemporaries, and by later thinkers. While Huygens greatly admired the work, he found obscurity in some parts, and desired a fuller explanation of the cause of gravity.⁸ Leibniz went further in saying that Newton appeared to regard gravitation as an inexplicable and incorporeal virtue, and that he failed to explain why the planets all revolve around the sun in the same direction and almost in the same plane.⁹ Far more profound were his

⁸ Huygens: *Œuvres*, ix, 321 (1689).

⁹ Leibniz to Huygens, 1690; Huygens: *Œuvres*, ix, 523.

criticisms of Newton's assumptions of absolute space and absolute time—so profound, indeed, that they were not fully appreciated until revived by Einstein in the twentieth century.

These criticisms left Newton cold, for they seemed to him beside the point. Made wary by the failure of others to set up a water-tight cosmology capable of explaining all phenomena in inexpugnable logic, he aimed only to elucidate the mathematical formulæ of observed processes. In Book III of the *Principia* he frankly admitted:

Hitherto I have not been able to discover the cause of these properties of gravity from phenomena, and I frame no hypotheses: for, whatever is not deduced from the phenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical, have no place in experimental science.

And again he wrote to Bentley:

That gravity should be innate, inherent, and essential to matter, so that one body may act upon another at a distance through a vacuum . . . seems to me a great absurdity.¹⁰

But he did not feel called upon to explain one absurdity by inventing another and gratuitous absurdity. His defense was a demurrer.

He would have raised the same defense against the most recent philosophers who, as do Eddington and Bertrand Russell, assert that all the earlier physics, before the twentieth century, was at best analytical, working out the ideas implied in the preliminary definitions, and at worst tautological, consisting of a series of identical propositions. Newton's law, according to this school, is merely a convenience of measurement, exactly on a par with the discovery which someone unfamiliar with the English measurement might make, that three feet always equal one yard. And yet, even if the law of inverse squares follows deductively from the definitions of mass and motion, nevertheless it took a mighty genius to deduce it.

¹⁰ *Opera*, iv, 438 (1693).

Judged historically, the *Principia* must still pass as the most momentous work of science ever produced. The accuracy of Newton's theory proved amazing. For more than two centuries every fancied discrepancy was resolved. For at least a century a large number of brilliant minds found their life-work in elaborating the Newtonian system. Many a great feat of science was performed by following his casual hints. Only in the twentieth century have physicists tried to supersede Newton on account of minute discrepancies supposed to be found between his theory and the observed facts.

The work of Newton was rewarded with every honor in the power of his countrymen to show. The chorus of praise arose promptly and sounded loud. Edmund Halley prefixed to the *Principia* a poem proclaiming that by discovering the secrets of nature the author had raised the lot of humanity higher than had the legislator who first forbade murder, theft, and adultery, higher than the first founder of cities and the first inventor of viniculture, agriculture, and music; and that no mortal could come nearer to the gods. John Locke bade the human race congratulate itself on the possession of so great an ornament. James Thomson exhausted the resources of language in a eulogy of Newton published at his death; and in his pastoral *Summer* apostrophized Nature in these terms:

Let Newton, pure intelligence, whom God
To mortals lent to trace his boundless works
From laws sublimely simple, speak thy fame
In all philosophy.¹¹

Alexander Pope put the judgment of his age in an epitaph intended for the scientist's tomb:

Nature and Nature's laws lay hid in night:
God said, Let Newton be! and all was light.¹²

¹¹ *The Seasons: Summer*, lines 1557 ff. The *Ode to Newton* in J. Thomson's *Poetical Works*, ed. J. L. Robertson, 1908, 426 ff.

¹² Other interesting allusions to Newton in Pope's *Essay on Man*, e.g., iii, 9 ff.

Next to his own countrymen the French were the first to sound his praises. Fontenelle, in an obituary eulogy, admitted the strength of him who had "destroyed the vortices of Descartes and overturned the immense celestial edifice which we might have thought impregnable." But Voltaire proved the chief herald of his fame. Residing in England at the time of Newton's death, knowing his niece and his friends, reading his works and those of his followers, Voltaire was enchanted at finding that reason had at last become incarnate, as it were, and had exhibited its full power to master the secrets of nature. In his *Letters on the English* he explained briefly Newton's optics and cosmology, as well as his theology and philosophy, and asserted that Newton was greater than Cæsar, Alexander, Tamerlane, or Cromwell, for

true greatness consists in having received from heaven a powerful understanding and in using it to enlighten oneself and others. . . . It is to him who masters our minds by the force of truth, not to those who enslave men by violence, it is to him who understands the world, not to those who disfigure it, that we owe our reverence.¹³

These letters, published in 1734, were followed four years later by a popular tract on *Elements of the Philosophy of Newton*, which exhibited in three parts Newton's metaphysics and theology, his optics, and his law of gravitation.¹⁴ The same purpose inspired a poem¹⁵ which, after declaring that the eternal substances, God's councilors, must be jealous of Newton, expounds his physics and cosmology, and bursts forth in the exclamation:

Que ces objets sont beaux! que notre âme épurée
Vole à ces vérités dont elle est éclairée!

Thus was gradually formed the universal opinion that Newton was not only the greatest genius that ever lived,

¹³ *Lettres sur les Anglais*, xiii; *Œuvres*, 1826, xxxv, 95.

¹⁴ *Éléments de la philosophie de Newton: Œuvres de Voltaire*, 1879, xxii, 397.

¹⁵ *Ibid.*, x, 299. Cf. also *ibid.*, xxxiv, 149.

but the most fortunate, because, as Lagrange put it, "there is but one universe and it can happen to but one man in the world's history to be the interpreter of its laws."

The interest in Newtonism was so great that within a century after the publication of the *Principia* forty treatises about it, either popular or professional, had been produced in English, seventeen in French, eleven in Latin, three in German, one in Portuguese, and one in Italian. This bibliography, to be sure, falls short of the hundreds of books upon Darwinism and the thousands upon Relativity produced within a much shorter time than a century; nevertheless it then marked a new record in the history of science.

The professional, as distinct from the popular, acceptance of Newton's work, was rapid in Great Britain and somewhat slower on the European Continent. Within three years after the publication of the *Principia* it was taught at the Universities of Cambridge, St. Andrew's, and Edinburgh. In the Netherlands it met with the somewhat reserved approval of Huygens, and was not introduced at Leyden until Willem Jacob 'sGravesande, who had known Newton personally, became professor of mathematics there in 1717. It is difficult to say just when Newtonism began to be taught in the German universities, but it was well established there by 1741.¹⁶ The French universities, bound to Cartesianism, perhaps accepted the English science more reluctantly, for the *Principia* was not noticed in the *Journal des Savants* until 1715. Finally, however, educated by Voltaire and by some of their own astronomers, they capitulated.

3. ASTRONOMY FROM NEWTON TO LAPLACE

Fully a century was required to perfect celestial mechanics along Newtonian lines. The solar system, as known in the eighteenth century, consisted of eighteen members, the sun, six planets, ten satellites of planets, and Saturn's ring. Each of these bodies exercised a gravitational attraction on all the others, thus presenting, for mathematical

¹⁶ J. F. Weidler: *Historia Astronomiæ*, Wittenberg, 1741, 558.

explanation, a problem of almost inconceivable intricacy. Fortunately for the success of science, the pull of the sun on the planets, and of each planet on its satellites, is so much greater than all other pulls, that these can be treated, in a first approximation, as negligible. This is just what Newton had done, though he had not done it quite perfectly. He believed that certain irregularities in the movements of the celestial bodies could be detected; irregularities which, gradually accumulating with time, would in the end upset the equilibrium of the solar system and lead to its destruction but for the intervention, at long intervals, of a divine hand to set it right.

Three generations labored hard to perfect the system of celestial mechanics, and they labored so successfully that, by the time of Laplace (whose work will be described in the next volume) every anomaly had been eliminated and every irregularity explained, with the exception of some extremely minute discrepancies between the observed facts and the Newtonian theory, which are now accounted for by Einstein on the principle of Relativity.

The extremely intricate calculations necessary to perfect celestial mechanics were performed chiefly by Swiss and French mathematicians. To solve the problems set they were obliged to perfect mathematical analysis, which therefore proceeded *pari passu* with the development of physical theory. Jean Bernoulli began with an *Essay on Celestial Physics*¹⁷ (1735) in which he tried to explain the principal celestial phenomena and especially the physical cause of the inclination of the plane of the planets' orbits in relation to the plane of the equator of the sun.

More important were the essays of Leonhard Euler and of Alexis Claude Clairaut (1731-65) each of whom reduced to order certain apparent irregularities in the Newtonian mechanics. Still more successful was the work of Jean-le-Rond d'Alembert (1717-83), who, in addition to valuable contributions to Diderot's *Encyclopédie* and to stimulating essays on many branches of popular science, produced a

¹⁷ *Essai d'une nouvelle physique céleste*, Joh. Bernoulli: *Opera*, iii, 261.

Treatise on Dynamics, one on the *Precession of the Equinoxes*, and others on lunar theory. In all of these he gave precision and a firm mathematical framework to observed facts previously only partially, or erroneously, apprehended.

While the theory of celestial mechanics was perfected by the labors of mathematicians, astronomy was also enriched by the observations of the heavens. Edmund Halley (1656-1742), Newton's friend and Astronomer Royal in charge of the national observatory at Greenwich, calculated the orbit of a comet which appeared in 1682, and predicted its return in 1759. His studies of astronomical history revealed to him that a comet of the same general appearance had been observed at intervals of about 77 years. Rightly believing this to be the same comet, revolving around the sun in an orbit of enormous eccentricity, he was able to foresee its re-appearance in 1759. When this prediction was verified, the comet was named after him. Halley's careful study of ancient astronomy also led him to discover that some of the fixed stars had perceptibly changed their place since the first celestial maps were made. This discovery, which he published in the *Philosophical Transactions* in 1717, is commonly said to be the first observation of the proper motion of the fixed stars. It has recently become known, however, that the same observation, based on the same careful comparison of ancient with modern tables, had been made three quarters of a century earlier by Giovanni Pieroni. But his account remained unpublished and unknown until 1906.¹⁸

To two astonishing discoveries of James Bradley (1693-1762) that of the aberration of light and that of the nutation of the earth's axis, does modern astronomy owe its exactness. After his graduation from Oxford Bradley took holy orders, but later decided to devote his life to observation of the visible, rather than to meditation on the invisible, heaven. First as professor of astronomy at Oxford, then as Astronomer Royal at Greenwich, he began a series of extraordinarily careful observations, which showed him that the stars

¹⁸ *Opere di Galileo*, Edizione Nazionale, xviii, 138 ff., 163 ff., 311. *History of Modern Culture*, i, 53.

appeared to move throughout half of the year slightly to the north, and throughout the other half of the year to the south. After testing, and rejecting, the hypotheses that this apparent motion is due to the change of the earth's position in its revolution around the sun, or that it is due to a change in the direction of the earth's axis, he hit upon the true explanation, which he published in the *Philosophical Transactions* of 1728 in these words:

At last I conjectured that all the phenomena hitherto mentioned proceeded from the progressive motion of light and the earth's annual motion in its orbit. For I perceived that, if light was propagated in time, the apparent place of a fixed object would not be the same when the eye is at rest, as when it is moving in any other direction than that of a line passing through the eye and the object; and that when the eye is moving in different directions, the apparent place of the object would be different.

In other words, light does not fall "straight down" on us from its source, but its direction appears to us to be changed by our own motion. An illustration will make this plain. If a man is walking rapidly through the rain on a windless day, the rain does not hit him perpendicularly, but appears to come from the front. To ward it off he must slant his umbrella, pointing it ahead of him. Thus it is with light; the beams take a direction that is dependent on the movement of the earth as well as on their source.

In 1731 Bradley discovered, by similar careful observations, slight movements in the positions of the stars, which he rightly attributed to a nutation of the earth's axis in a period of eighteen days. These two discoveries first made possible the high degree of exactitude necessary to modern astronomy. Without them, it would be impossible for the most careful observer to make the seen position of the stars agree, within 50", with their calculated position.

Descriptive astronomy was much enriched by a catalogue of the southern stars published by Nicholas Louis de Lacaille who headed an expedition to the Cape of Good Hope during the years 1750-54. The transits of Venus of 1761 and 1769

were observed with immense care by many expeditions to distant parts of the world, ranging from Siberia to California. Some of these were fitted out by governments, some by private individuals, and some by academies of science. One was sent by the American Philosophical Society. The reason for these journeys to far countries was that it was important to observe the parallax of Venus from as widely separated places as possible on the earth.

4. MATHEMATICS

Among the many extraordinary triumphs of the genius of the seventeenth century the invention of the infinitesimal calculus is certainly not the least. That there was something in it congenial to and demanded by the spirit of the time cannot be doubted. We may, indeed, safely leave to fanciful philosopher-historians like Oswald Spengler the assertion that the infinitesimal calculus is in science what contrapuntal music is in art, and that the two together are the most characteristic products of the "Faustian" mind, that is, of the culture of Western Europe since the time of Charlemagne until the present. But may we not soberly hazard the speculation that, just as analytical geometry expresses the *generalizing* tendency of modern as opposed to the *particularizing* character of most ancient mathematics, so the infinitesimal calculus expresses two other characteristics of the modern mind, its subtlety and its perceptivity of the dynamic as opposed to the static properties of things? The age which penetrated, with microscope and telescope, into the secrets of the inconceivably small and of the immeasurably large, could not fail to seek and to find an instrument for dealing with infinites and infinitesimals; the age that created dynamics could not but notice the ever changing speed and direction of moving bodies, and create methods for measuring this change.

And the infinitesimal calculus is just this—a body of rules and processes by which continuously varying magnitudes are subjected to mathematical analysis. The name "infinitesi-

mal" was applied to the new method, because the variations with which the first arguments dealt were regarded as infinitely small quantities, vaguely conceived as in a nascent or evanescent state between zero and the smallest assignable finite quantity. But this conception was finally discarded, in the eighteenth century, as unnecessary and as obnoxious to philosophical criticism.

The invention of the calculus simultaneously by Newton and Leibniz was preceded by a long line of mathematical reasoning, which led from one refinement to another until the method was at last perfected. The first traces of the infinitesimal in thought are perhaps found in the celebrated riddle of Achilles and the tortoise posed by Zeno the Eleatic. But the idea played no part in mathematics until Kepler, in order to measure the cubic contents of a barrel, introduced the first refined method of approximation by which the limit to which variables approach is ascertained.¹⁹ He regarded the area bounded by a curve as measured by the radii drawn from some point within it to the circumference, theoretically an infinite number, but conveniently treated as a large number approaching infinity. His methods of summing these up proved to be the starting-point of all later cubature.

The idea of infinitesimals was rendered more familiar by the invention of logarithms, the increments of which were regarded as variables and as extremely small. A number of brilliant minds, including Bonaventura Cavalieri, Giles Personnier de Roberval, Torricelli, Descartes, Pascal, Fermat, John Wallis, and Isaac Barrow, gave precision and refinement to the new methods until they all but divined the secret of the differential calculus. So close had they come to the final process of integration, that it is not strange that two geniuses, Newton and Leibniz, should independently have invented it.

Gottfried Wilhelm Leibniz (1646-1716) was one of the most universal geniuses of the age and perhaps the last of the race which took all knowledge for its province. For he

¹⁹ *Nova Stereometricorum Doliorum Vinariorum, Opera*, iv, 551.

wrote, and wrote importantly, on mathematics, physics, philosophy, theology, history, law, politics, economics, and philology. This universality of interest was caused by and reacted upon his highest ambition, which was to unify the world in one great society, with one religion, one language, one polity, one philosophy, and one science. Indeed, he aimed at no less than reducing all thought to a calculus expressible by symbols as convenient as are those of mathematics, and capable of no less certain manipulation. Because his aim was impossibly high, he failed to achieve as much in any one field as his great rival, Newton, did in several. Hardly ever able to complete a large, systematic work, his thought has survived for us chiefly in small essays and articles contributed to journals, and in a vast correspondence, not yet fully published, which will fill twenty-one large volumes in the new edition undertaken by the Berlin Academy. Writing with equal facility in Latin, French, and German, Leibniz corresponded with half of the celebrated men of his time. His list of letters reads like an index to the intellectual history of his age. And these letters are full of precious thought, usually taking the form of suggestive comment, or penetrating criticism, on the work of someone else.

As the son of a professor of moral philosophy, and as the grandson of a professor of law, at the University of Leipzig, he inherited ability and was bred in an atmosphere of intellectual warmth. Entering the university at the age of fifteen (1661) he graduated as Master of Philosophy in 1664 and Bachelor of Law in 1665. Visiting London for short periods in 1673 and again in 1676, and spending the intervening three years at Paris, he profited by the acquaintance of the leading scientists, philosophers, and divines in both capitals. In 1676 he was appointed councilor and librarian to the Duke of Brunswick-Lüneburg, who after 1692 was known by the higher title of Elector of Hanover. Residing generally at the city of Hanover from 1676 till his death forty years later, he made frequent trips to other parts of Europe.

Newton and Leibniz invented the calculus independently

and at about the same time. Their purposes, their approach, their methods, were entirely different. Newton's sole aim was to create an instrument for mastering physical problems, almost all of which can be formulated as differential equations. With Leibniz the felt need was so different that it may be called almost the contrary or opposite to this. What he wanted was not to make mathematics a more useful servant to the natural sciences, but to free it completely from that bondage and to make it an autonomous instrument of pure thought without other end or purpose save its own perfection.²⁰ It is interesting to notice here the same dichotomy of thought that split the science and philosophy of the eighteenth century into two schools. On the one side were the sensualists, who, with Locke as their leader, found the gate of all knowledge in the senses; they were the physicists and experimenters. On the other side were the rationalists, who, with Leibniz at their head, discovered the chief avenue to truth in the processes by which reason worked over the ideas innate in the mind; they were the mathematicians.

Newton had arrived at his methods and characteristic notation as early as 1665, but none of his three works on it was published until long after this date. He called his new calculus the method of fluxions, because he regarded the variable quantity as generated by the movement of a point, line, or plane, and called this generated quantity a fluent and the rate of its change a fluxion. The fundamental image in his mind was that of a constant flow, or change produced by motion.

Leibniz, on the other hand, had started with the mathematics of Huygens and Pascal, and had arrived at the most remarkable generalizations of his method by 1673. That he could not have plagiarized Newton, as charged at the time, nor Barrow, as lately insinuated, was clear to me when I

²⁰ He expressed this most clearly in a letter to Huygens of 1691, *Œuvres de Huygens*, x, 129: "The beauty of my calculus is that it brings forth truths by a sort of analysis without any effort of the imagination, which usually succeeds only by hazard."

studied the historical problem some years ago, and has now been demonstrated conclusively by Mahnke. In 1676 he inquired from Oldenburg of Newton's method of quadrature, and was answered by two letters of Newton to Oldenburg, in which the Englishman gave some information about his process, but concealed the crucial part of it in an anagram. Friendly relations between the two were maintained for many years; Newton writing his rival in 1693: "I esteem your friendship most highly, and I shall always consider you among the supreme geometricians of this age."²¹ The question of priority was unhappily mooted by a Swiss mathematician in 1699, with a hint that Leibniz was indebted to Newton. Leibniz replied, in an anonymous review of Newton's *Optics*, published in the *Acta Eruditorum*, with an insinuation that Newton had borrowed something from him. Further charges of plagiarism were made ever more precise and ugly by the followers of each leader, until in 1711 Leibniz appealed to the Royal Society for protection against the libel. As the members of this body, now under Newton's presidency, idolized their master, their report, with the best intentions, could not be unprejudiced. This report, published in 1713, charged Leibniz with plagiarism. After the death of the great German, the battle continued to be waged between his partisans and those of Newton.

It is not within the scope of this book to explain the integral calculus, which, to be understood, requires arduous study. Suffice it to say, from the historian's standpoint, that its invention was both the consummation to which mathematics had long been tending and the starting-point from which most progress was made, in that science, in the eighteenth century. The perfecting of the new processes, and their exploitation for further conquests, fell chiefly to the lot of Swiss and French mathematicians, rather than to the English, and this, in turn, was due to two facts, the triumph of the Leibnizian notation on the Continent and its rejection in England, and the violent attack made on the method of fluxions by the philosopher Berkeley.

²¹ Leibniz: *Mathematische Schriften*, i, 168.

As to the first matter—that of notation—the symbols introduced by the German proved more convenient. To him is due the symbol dx to represent the difference of the x 's, and the symbol \int which he at first read “all,” but after 1695 “integral,” for the limit of the sum of all terms within certain boundaries. Realizing more clearly than anyone else has done the importance of well-chosen symbols as aids to thought, he became the “master-builder of mathematical notation,” devoting much time to its perfection, and inventing a number of signs used ever since.²²

While the Continentals were consolidating their ranks, civil war had broken out among the English mathematicians. The leader of the revolt against Newton was George Berkeley (1685-1753) a profound philosopher and noted Christian apologist of whom more will be said in another chapter.²³ His interest in the matter was threefold—scientific, philosophical, and religious. Strange as it may seem to see any school of mathematics attacked as atheistic, it was certainly the supposed connection between the growth of mathematics and the decline of religious faith that first inspired the good bishop's onslaught. Roused to fury by those who contrasted the certainty of science with the uncertainties of faith, and particularly incensed by Edmund Halley's preferring Newton to Moses and the *Principia* to the Ten Commandments, Berkeley subjected the philosophical foundations of the calculus to a hostile scrutiny, and published his results in a work called *The Analyst* (1734) addressed “to an infidel mathematician” supposed, with much probability, to be Halley himself. In this he attacked the method of fluxions as a retrogression from the more exact processes of ancient geometry, and as based on ideas not only unproved but inconceivable. Fluxions he described as “neither finite quantities, nor quantities infinitely small, nor yet nothing.” They might, in short, be called “the ghosts of departed quantities”; or, rather, they were

²² See Cajori in *Isis*, vii, 412 ff., 1925; and his *History of Mathematical Notation*, 2 vols., 1928-29.

²³ *Infra*, chap. v.

those increments of the flowing quantities *in statu nascenti*, in their very first origin or beginning to exist, before they become finite particles. And it seems still more difficult to conceive the abstracted velocities of such nascent imperfect entities. . . . If we remove the veil and look underneath, if, laying aside the expression, we set ourselves attentively to consider the things themselves which are supposed to be expressed or marked thereby, we shall discover much emptiness, darkness, and confusion; nay, if I mistake not, direct impossibilities and contradictions.

Fluxions were, in short, absolutely incomprehensible and as much a mystery to reason as any dogma of the faith. That the processes produced valuable results Berkeley explained as due to the fact that two opposite errors compensated each other. The work was a bomb thrown into the citadel of science which, by its explosion, destroyed much that had been too readily accepted. Those who rebuilt the demolished fortifications planned them more circumspectly. Ultimately the effect of Berkeley's attack was to sweep away the unsound idea of the infinitesimal, which was banished from the treatises on fluxions by Maclaurin and Robins, the leading English mathematicians of the following generation.

While the Islanders were debating the metaphysical foundations of the calculus, the Continentals were fashioning it into the most powerful tool as yet devised for working with natural phenomena. For two generations after Newton and Leibniz most of the great mathematicians of the world came from Basel, a small Swiss town on the upper Rhine, whose exceedingly active intellectual life for three centuries reproduced, as on a small scale, all that was enacted on the greater theater of Europe. Several of them belonged to the family of Bernoulli, one of those gifted races, like that of Huygens or of Darwin, in which genius flowers in many branches. The brothers Jacob (1654-1705) and Johann (1667-1748), their nephew Niclaus, and the two sons of Johann, Niclaus II and Daniel, all won laurels in science, and especially in mathematics. Perhaps the greatest of them all was the founder of the dynasty, whose *Ars Conjectandi* (Art of Inference, or Art of Conjecture), published

posthumously in 1713, is one of the most original treatises on numbers ever published. Early seized with enthusiasm for the Leibnizian algorism, he devoted much time to perfecting it, inventing a series of special numbers, still known as the Bernoulli numbers, which are—we may take the word of the experts in such matters—of the highest utility in analysis. But the main purpose of his work, as indicated by the title, was so to investigate the laws of chance as to give a rational basis for forecasting the probability of an event, or of establishing, on the basis of a given number of experiments, the likelihood that a given result will be right. From these investigations emerged the famous formula stating, in more accurate terms, the theory that if, in any series of experiments, there is a certain probability of a given result, the number of experiments can be increased so as to make the degree of probability as great as desired.²⁴ This theorem formed the basis of Poisson's law of large numbers, the importance of which, in statistical investigations, cannot be overestimated.

Niclaus Bernoulli (1687-1759) developed the application of his uncle's theory to social statistics, estimating, for example, the interval of time sufficient to make it probable that a person who has disappeared is dead; the premium necessary to assure a girl a dowry on the day of her marriage; and the probability of the truth of different types of testimony.

Pursuing the same line of investigation Daniel Bernoulli (1700-82) criticized the doctrine of mathematical probability, for which he would have substituted the doctrine of moral expectation. For example, said he, let A throw a coin into the air on condition that, if it turns up heads at the first throw he is to receive a dollar from B; if heads does not appear until the second throw he is to receive two dollars, if not until the third throw four dollars, and so on forever, doubling the stake at each throw that falls tails. Now, by strict mathematical deduction, A's expectation is infinite,

²⁴ For an accurate statement of this law, and a discussion of Probability, see: J. M. Keynes: *A Treatise on Probability*, 1921, 340.

for it is half a dollar, plus half a dollar plus half a dollar, and so on without end. But this result contradicts common sense, for no man would give a large sum for the chance of winning a larger on such a bet. Furthermore, argued Daniel, the same sum of money has a different value for different men. Ten thousand dollars is worth more to a pauper than to a millionaire. This loads the dice against all gamblers; for the first ten thousand is worth more than the second. That is, if a man, worth just ten thousand, stakes it all on an even chance of losing or doubling it, he makes a bad bet, for the ten thousand he may lose is worth more to him than the ten thousand he may win. Is not this the theory of marginal utility which played so great a part in the nineteenth-century economics of Böhm-Bawerk and John Bates Clark?

A fellow-townsmen of the Bernoullis, and a pupil of Jacob, was Leonhard Euler (1707-83), the world's most prolific mathematician, and one of its very greatest. Gifted with an almost miraculous power of calculation, he was capable of writing worthless, or even silly, stuff when he ventured outside his own province. Even in the other exact sciences, though he now and then discovered important truths, he as often wandered into error, because of his exclusive preference for the deductive method. So great was his confidence in the infallibility of numbers that he acted on the dangerous principle that experiment is unnecessary. When he had proved that a thing must be so, it must be so—and sometimes it was found not to be.

The son of a clergyman, educated at the university of Basel, and chiefly by its most famous professor, Jacob Bernoulli, he evinced the precocity of genius by publishing, at the age of nineteen, an important mathematical essay. This led to his call to the Academy of Sciences, founded not long before, by Peter the Great at St. Petersburg. Here he spent fourteen busy years (1727-41), paid a salary of 1,200 roubles, and plied with every imaginable sort of task, from drawing plans for ships, and raising the great bell in Ivan's Tower at Moscow, to reforming the public finances and

teaching elementary arithmetic. With it all, however, he found time to contribute copiously to the *Petersburg Scientific Journal*, and to write important books on various fields of mathematics. Of one of these, the *Mechanics* (1738) Bernoulli said: "No book has ever appeared so richly furnished with high and secret matters drawn from the very heart of numbers."

From St. Petersburg Euler was called to the Academy of Sciences at Berlin by that Frederick who was eager to make his capital the Athens, as well as the Sparta, of modern Europe. Though the next quarter century (1741-66) was no less prolific than the earlier period, Euler was not altogether happy in his new environment. Becoming involved in the quarrel between Voltaire and Maupertuis, he had to submit to the ridicule of the first wit of Europe. On the death of Maupertuis (1759) Euler became head of the Academy, rather to the disgust of his royal master. To give lustre to his capital Frederick wanted a man of the world and a master of French prose, not merely a mathematical genius who was awkward in company and who excused his taciturnity by saying he had come from a land where a man was hanged if he said anything. Moreover Frederick was absorbed in the war, and terribly pressed financially. Without reluctance, therefore, he allowed Euler to return to St. Petersburg, where the old man found a warm welcome from Catherine II, together with an adequate income and whatever honors the Republic of Letters could bestow. Only in these last years (1766-83) did a misfortune evince the heroism as well as the full genius of his mind. Having lost one eye through an infection in 1734, he lost the other through cataract in 1766. As a painful operation failed to restore his sight except for a very short time, he remained blind for his last seventeen years. Marvelous to relate, this was his most prolific period. Of the eight hundred books and articles published by him, half come from these blind years.

Euler has left a permanent legacy to modern mathematics. We have the Eulerian polyhedron, the Eulerian constant, the

Eulerian formula for the summation of series, the Eulerian integral, and many Eulerian equations, rules, and theorems. He freed analysis from its geometrical and mechanical bondage, and taught his successors to solve problems simply and clearly. His *Introduction to the Analysis of Infinites*, his *Institutes of the Differential Calculus*, and his *Institutes of the Integral Calculus*, advanced and perfected processes necessary to science. His work on logarithms, on "the three-body problem," on trigonometry, on probability, and on the calculus of variations, marked the most important progress and the most profound research in the field of numbers made during the century. His only contemporary rival was d'Alembert, whose great works on dynamics supplemented and perfected the researches of Euler, and supplied new instruments of thought necessary for dealing with the ever more complicated problems of physics.

Some original contributions to mathematics were made by Abraham de Moivre (1667-1754) a Huguenot who left France after the revocation of the Edict of Nantes, and settled in London, where he joined the Royal Society and prosecuted distinguished studies on the powers and roots of infinite equations. In 1733 he began investigations that proved ultimately of great value in statistical method. He found that in classifying data, susceptible of mathematical treatment, taken at random, most phenomena would fall near the middle of the series and fewer at each extreme. These data could then be plotted as a curve, what is now known as "the normal curve." A little later De Moivre announced the formula for the "curve of error," that is, the rule for finding the chance, in a computation based on statistical data, that the conclusion will be erroneous. His theory that the measure of accuracy in such a computation depends on the inverse square root of the size of the sample taken, proved immensely important to later demographers. To its author, however, its main value was theological; for he made it the basis of a bizarre proof of the probability of God's existence, assuming certain irregularities in nature.

Even before the labors of Bernoulli and De Moivre had

elucidated the theory of probability, Edmund Halley began to apply it fruitfully to social phenomena. In 1693 he published a treatise entitled: *An Estimate of the degrees of Mortality of Mankind, drawn from curious tables of the Births and Deaths of the City of Breslau, with an Attempt to ascertain the Price of Annuities upon Lives*. These tables were not arbitrarily or hastily selected, but were subjected to a careful and critical sifting before they were used as the data for research. The conclusions emerging, at that time fresh and unsuspected, included the following: Of every thousand children born alive, 145 die during the first year, so that it is a bet of six to one that any child will live to its second year. When a man is thirty it is "an even lay" that he will live 27 or 28 years longer. As half the population die before the age of 17, no one living over that age should complain of an untimely death. Of course these statistics apply only to the time and place from which they were taken. In our day longevity has increased as the death-rate has fallen.

We may conclude our account of mathematics during the Enlightenment with reference to a work wholly outside the main current of contemporary thought, a work so original as to remain completely unnoticed in its own age, and to be hailed in ours as the first of those non-Euclidean geometries which have played so enormous and so new a part in the scientific thought of the last century. Girolamo Saccheri was born at San Remo in 1667, entered the Jesuit order, and taught philosophy and theology at the University of Turin. His first book, a *Demonstrative Logic*, published in 1697, contains the germ of his later thought. His achievement in it is to insist on the difference between "nominal definitions" and "real definitions," that is, between propositions arbitrarily asserted and taken as the starting-point for a chain of reasoning, and propositions proved by experiment to be true. The proof that each kind of proposition can be used equally well in logic started the author on his second book, the *Euclid Vindicated*, published in 1738. As everyone knows, Euclid bases his geometry on a series of axioms

incapable of proof and taken for granted. Of these the most famous is the fifth: that parallel lines in the same plane, prolonged to infinity, never meet. Many mathematicians had tried in vain to prove this proposition before Saccheri essayed to prove it by showing that the supposition that it is not true leads to contradictions. The path of this contradiction leads through a series of propositions forming the main part of a non-Euclidean geometry, the first ever published. In trying to vindicate Euclid from the charge of making unwarranted assumptions, the Jesuit reasoner had actually shown that one could build up a body of geometry as logical as his on entirely different axioms, and thus create a world in which parallel lines meet, in which not a straight line but a curve is the shortest distance between two points, in which the three interior angles of a triangle make more than two right angles, and in which, in short, any number of propositions, repugnant to common sense, can be given a firm logical body. The vast import of this discovery remained hidden from the eyes of the world for another century.

5. OPTICS: THEORIES OF THE ETHER

Newton's fame, like the priestess at Delphi, sits on a tripod, uttering oracles to the world. That is, it is supported by three legs, one of which is the discovery of the law of gravitation, one the invention of the calculus, and the third the discovery of the nature of color. Any of the three achievements would have given him a place in the front rank of renown.

During Newton's youth a few important discoveries in optics were announced. Edme Mariotte (1620-85), a Burgundian priest and also a member of the Parisian Academy of Sciences, studied fluorescence, explained the colored rings, or coronæ, around the sun and moon as due to the refraction of the rays by particles of vapor or melting snowflakes, or by bits of ice which acted as prisms. A great sensation was made by his discovery of the blind spot in the eye, which

he demonstrated before King Charles of England in 1668. In dissecting the eyes of animals he was struck by the fact that the optical nerves in the back of the eye were not directly opposite the pupil, and consequently he experimented with his own vision to such good purpose that he learned, what had escaped the notice of all men thitherto, that there is a portion of the retina which is blind, and which therefore leaves a blank in the field of vision.

More important was the discovery of the velocity of light by the Danish astronomer Olaus Roemer (1644-1710). Until his time it was commonly held that light was propagated instantly, that is, that it took no time at all to travel from its source to an illuminated object, however distant. Roemer, however, observed that the revolutions of the satellites of Jupiter did not appear to be quite on time; that is, their eclipses came either too soon or too late according to the relative position of the earth and Jupiter. He rightly inferred that this apparent irregularity was due to the time that it took for light to travel from the sun to Jupiter and from Jupiter to the earth, and made the correct calculation that light travels from the sun to the earth in about eight minutes.

Then came Newton's discovery of the spectrum and the nature of color, a discovery so surprising and so contrary to the accepted views that he described it as "the oddest if not the most considerable detection which hath hitherto been made into the operations of nature." Like his other great ideas, it came to him early in life, at least as early as 1666, and, like his other great ideas, it was not given to the public for many years. In 1669, however, he chose optics as the subject of his first lectures at Cambridge. In 1772 he described in the *Philosophical Transactions* a new form of telescope. Hitherto telescopes had been made by fitting two lenses at the ends of a tube; for one lens Newton substituted a concave mirror. While this telescope had considerable advantages, it did not become fully practical until the discovery, a century later, of a method of achromatizing lenses. The real difficulty was found to be, not the working

out of a perfect theory, but the casting of large pieces of glass of uniform quality throughout. The first successful achromatic telescope was made about 1750 by Chester Moore Hall, who used two kinds of glass of different refracting indices, one correcting the other. Not until the nineteenth century, however, were large Newtonian reflecting instruments much used.

The lectures of 1669-71, and the article of 1672, and a letter to Huygens in 1673, explained the fundamental discoveries of the nature of color. But the book on the subject, written in 1675, was not published until 1704. In this, at last, he revealed to an expectant world the secret of color, which he had discovered by studying the decomposition of sunlight by passing it through a triangular glass prism. The beam falling on the prism does not come out the other side as the same white light that it is when it enters, but casts upon a screen at the under side of the prism the spectrum, or rainbow-like band of bright colors, beginning with red at one end and passing through yellow and green to violet at the other end. Newton at once saw the true explanation of this: that white sunlight consists of a bundle of different kinds of beams which are sorted out by the prism because they have different degrees of refrangibility, those which bend the most being violet and those which bend the least, red. He made this theory certain by what he called his crucial experiment of passing the colored beams from one prism through another prism; neither by this method nor any other could he change the colors once sorted out by the first prism. These colors, therefore, must be dependent on the sort of beam perceived by the eye.

Newton next examined the colors of thin plates, as in bubbles and other films. By pressing a glass prism on a lens of known curvature he produced colored concentric rings; or, if using light of one color, he saw a dark patch in the center, then a ring of color, then a dark ring. These are now known as "Newton's rings," though they had been noticed before him by Robert Hooke.²⁵ Newton drew the inference

²⁵ Gunther: *Early Science at Oxford*, VI, xvii.

that a beam of light could not be the same all along its length, but had fits of easy and of difficult transmission. He even measured the "space it passes between every return and the next return," which he called "the intervals of its fits," as $\frac{1}{89,000}$ part of an inch. (If this he interpreted as the wave-length it is of the right order of magnitude but only about half the correct numerical value.) All this seems to cry for the wave-theory of light; but Newton rejected it because he thought it failed to explain the existence of sharp shadows, that is, of the rectilinear propagation of light. His final opinion of the nature of light is suggested in Query 29 at the end of his *Treatise*:

Are not the rays of light very small bodies emitted from shining substances? For such bodies will pass through uniform media in right lines without bending into the shadow, which is the nature of the rays of light.

He explained the opacity or transparency of bodies by saying that it depended on the size of the spaces between the ultimate particles in the bodies: those which would allow light-corpuscles to pass being transparent, and those which stopped them being opaque. Color, he thought, depends upon the size of the particles of the body in comparison with the size of the corpuscles of light. So near was he to the wave-theory that he further suggested that rays of light might be "small bodies which by their attractive powers, or some other force, stir up vibrations in what they act upon." Vibrations of some kind he found necessary to explain the periodicity of light transmission. He also contemplated the ether of space as playing a similar part, that is, the part of a transmitter of light and heat. Finding that if two thermometers were enclosed in glass vessels, one vessel full of air and the other a vacuum, and if the vessels were moved from a cold room to a warm one, the thermometer in the vacuum would rise almost as fast as the one surrounded by air, he therefore concluded that heat is transmitted by a medium subtler than air, which remains after the air has been pumped out. Believing that this medium, the

ether of space, is the same as that by which light is reflected, transmitted, and refracted, he went on to suggest that refraction is due to the different density of this medium in different bodies, and that it is denser in light bodies and less dense in heavy ones, and much rarer in the sun and planets than in free space. This would explain the higher velocity of light in dense media (like glass) which is required by the emission theory.

But even as Newton wrote, the wave-theory was in the air—or, perhaps one should say, in the ether. Suggested by Hooke, considered by Newton, it was brought to a high perfection by Huygens. Having presented it to the Parisian *Académie des Sciences* in 1678, he published it in a fine *Treatise on Light* (*Tractatus de Lumine*) in 1690—a treatise as luminous as the subject which it discusses. The first chapter shows that light is produced by a certain movement, that no substance passes from the luminous body to the eye; that light spreads spherically almost as sound does; and that it takes time to spread. In short: “Light is transmitted, like sound, by surfaces and spherical waves. I call them waves because of their likeness to those formed when a pebble is thrown into the water.” But light differs from sound in its origin and manner of propagation, and in the media through which they are propagated. “Luminous bodies float in a subtle medium which agitates them with great rapidity and makes them strike against the particles of ether which surrounds them and which are much smaller than they.” The author labors to explain why light goes in straight lines by saying that the waves are bounded by straight lines. The emission theory he rejected for two reasons. First, because rays of light cross each other in different or even in opposite directions without interference. Second, because the enormous speed of light could not be explained by motion, but could be explained by transmission in another way, analogous to the almost instantaneous transmission of force through a line of billiard balls, so that when a ball at one end is struck, the ball at the opposite end will fly off.

An examination of the other properties of light led the

author to explain transparency by saying either that transparent bodies admit the ether, and opaque ones exclude it, or that transparent bodies have a structure allowing the transmission of waves as does the ether, but at different speeds, which accounts for the phenomena of refraction. The most extraordinary case of refraction Huygens found in Iceland spar (or calcium carbonate). This is the so-called polarization of light, a phenomenon that suggests that beams of light have a structure that depends upon their position. Imagine the spar to have a structure like a grid-iron, with parallel bars going one way but not the other. If two of these "gridirons" are held so that the bars in both are perpendicular, or in both horizontal, they would still allow the vibration of strings passed through them. But if one is turned, so that the bars of one are perpendicular and in the other horizontal, the strings passed through them will be locked, and unable to vibrate in any direction. So it is with Iceland spar, or, more clearly, with a Nicol prism or pieces of tourmaline. If two pieces are held together in the right position, light will be transmitted; if one piece is turned, but not the other, the double lens becomes opaque.

Notwithstanding the cogency of Huygens's reasoning the wave theory of light succumbed to the emission theory because of the great prestige of Newton. After a hundred years it was revived by Fresnel and Young, and so firmly established that it held the field until the twentieth century. All experiments on light made in the nineteenth century seemed inexplicable except on the wave theory. Other experiments, particularly those on photo-electricity, made in the twentieth century seem to be inconsistent with the wave theory, and require a corpuscular explanation. "It is now evident," says a recent authority,²⁶ "that some combination of the two theories is necessary, based on an association of particles with waves, but the new Newton who will be able to present us with a fusion of these two rather contradictory points of view into one simple and consistent theory seems not yet to have appeared."

²⁶ F. A. Saunders: *A Survey of Physics*, 1930, 474.

Even during the eighteenth century, however, there were scientists who preferred the wave-theory to the emission theory then more commonly held. Chief among them was the great Euler, who rejected the emanation hypothesis on the ground that, if the sun were pouring out floods of luminous matter at a prodigious velocity, he would soon become exhausted, and also because, if the emission theory were true, the rays of light from the sun and from the stars would collide with great violence.²⁷ Leibniz also complained that Newton's theory of color did not really explain what color is, and that his theory of emission of light could not be reconciled with polarization.

The phenomena of optics, together with those of gravitation, seemed to converge in suggesting the hypothesis of an ether of space. As early as 1683 Jacob Bernoulli even thought that he had succeeded in proving that this ether (which he identified with the "subtle matter" of Descartes's cosmology) had weight. Certain experiments with a barometer and with the cohesion of two polished plane marble blocks in a vacuum seemed to him to prove this.²⁸

Newton himself had felt obliged to "suppose that there is diffused through all places an ætherial substance capable of contraction or dilatation, strongly elastic, and, in a word, much like air in all respects but much more subtle."²⁹ This ether, he continued, pervades all gross bodies but is rarer in their pores than in free spaces, the difference in its density accounting for the phenomena of refraction. Ether is also rarer *near* dense bodies, and this accounts for gravitation, for, when bodies come nearer to each other the ether between them becomes rarer, in a graduated rarity, and thus the pressure of the ether from the large open spaces becomes heavier.

Another etherial hypothesis was proposed by Leibniz and more or less taken up by Huygens. In 1670 Leibniz wrote

²⁷ Euler: *Letters to a German Princess*, i, 78 (1760); *Dioptrica*, 1769, *Opera*, Series III, vols. iii and iv.

²⁸ See his treatise, *De Gravitate Ætheris*, and *Acta Eruditorum*, 1683, 106.

²⁹ Letter to Boyle, Feb. 28, 1679; Newton: *Opera*, iv, 385.

Oldenburg that the hypothesis of the circulation of the ether around the earth, contrary to the direction of its rotation, would explain the phenomena of attraction and repulsion, the verticity of the magnet, and the sympathies and antipathies of chemical elements.

As this hypothesis, with its claim to omnicompetence, was based on no more than the author's inner perception of the fitness of things, it deserved the neglect into which it fell, until Huygens took it up, criticized it, modified it, but adopted at least the theory of an ether circulating around the earth. In an appendix to his *Treatise on Light*, on the Cause of Weight, he explained that the hypothesis of a subtle fluid circulating around the earth, a fluid which might be identified with the luminiferous ether, would explain gravitation. He proved this by the experiment of filling a smooth-bottomed cylindrical vessel with water and sprinkling powdered sealing-wax on the bottom. When he started it revolving the sealing-wax, being heavier than the water, went to the sides of the vessel; but when he stopped it the wax went back to the center as the water continued revolving. Analogously the circulation of the ether around the earth would drive heavier bodies earth-ward. He even calculated the speed with which the ether must revolve, to account for the observed phenomena of gravity, as 17 times as great as the speed of the earth's revolution at the equator, and around the sun as 49 times as great as the speed of the ether near the earth. He thought that the assumption of the existence of a similar fluid circulating about a magnet would explain magnetism.

Selecting portions of the theories of Newton and of Huygens, and adding original thoughts of his own, Euler propounded a natural philosophy which he thought could explain all the changes observed to happen to bodies in nature.³⁰ These changes all have their cause, he asserted, in the nature and properties of bodies themselves, of which properties four are universal, or common to all bodies. These are: extension, mobility, inertia, and impenetrability,

³⁰ Euler: *Anleitung zur Naturlehre, Opera*, Series III, vol. i, 16 ff.

or, that property which prevents two bodies occupying the same space at the same time. Ether occupies all the space between coarse bodies, and its pressure gives rise to gravity, for the pressure is greater at a greater distance from the earth, thus driving bodies towards the earth more strongly than away from it. The weight of any given body is equal to the excess of the inward-pressing force.

6. DYNAMICS; MECHANICS; ELECTRICITY

The idea of mass as giving matter inertia and as distinct from weight had become clear by the time of Newton. He formulated the fundamental axioms, or laws of movement, as follows: 1. Every body continues in its state of rest or of moving uniformly in the same direction except in so far as it is compelled to change that state by impressed force. 2. The change of motion of a body is proportional to the impressed force and takes place in the straight line by which that force is impressed. 3. To every action there is always opposed an equal reaction; or, the mutual actions of two bodies upon each other are always equal and directed to contrary parts.

Newton settled once for all the problem of the relation of mass to weight. He first showed mathematically that the time of the swing of a pendulum must vary directly as the square root of the mass and inversely with the square root of the weight. As, in all cases of experiments with pendula of different weight, he found the time of oscillation equal for pendula of the same length at the same place, he concluded that mass and weight are always proportional.

The profound question of relative and absolute motion, which figures so largely in the theories of Einstein, was considered by Huygens and given the surprisingly modern answer that the movement of two bodies changing their position and distance is merely relative, but that movement in a circle is absolute. This conclusion, which at first reading seems so untenable and self-contradictory, has much to commend it to modern experimental physicists.³¹

³¹ C. Huygens: *Œuvres*, Tome XVI (1929), 189.

In 1691 Leibniz wrote an *Essay on Dynamics*—not published during his lifetime—to prove that, in the action of bodies on each other, the same quantity of movement is not conserved, but the same absolute force, or, the same quantity of action.³² He believed that in a moving body there exists what he called a “living force” proportional to the square of the speed. This idea was accepted by Johann Bernoulli and other physicists, but disputed by still others, who contended that the living force is proportional to the first power of the speed. The problem was not finally solved until d’Alembert (1743) and Euler (1746) proved that one could take it either way, as one pleases. That is, there lies an ambiguity latent in the words “force of a body in motion,” which might mean either “force acting through a certain distance,” or, “force acting through a certain interval of time.” In the first case it is proportional to the first power, in the second case to the second power of the speed of a moving body.

Thus it was that the Bernoullis, d’Alembert, and Euler attacked analytically problems hitherto solved only by the synthetic, or experimental, method. Johann Bernoulli enunciated the principle of virtual velocity, and approached the principle of the conservation of energy. Under the guidance of this principle—not yet clearly formulated, but instinctively apprehended—Daniel Bernoulli elaborated the laws of hydrodynamics mathematically, and then verified them experimentally (1738). Euler disengaged the laws governing the transverse vibrations of a string and of a stick. Francis Hawksbee in 1704 discovered the decrease of the pressure of gases moving rapidly through a tube.

While many other problems of dynamics were settled by d’Alembert and Euler, Maupertuis, the French president of the Berlin Academy of Sciences, and a noted geographer, announced as the final and all-comprehensive law of motion, the principle of least action, or “In every change in nature the magnitude of the used action is as small as possible.” In this crude form, the law is not universally

³² *Opera Mathematica*, vi, 215.

valid. Leibniz had already stated the principle more correctly when he pointed out that in certain cases the action is not a minimum but a maximum; and had therefore correctly announced the law as a principle of minimum *or* maximum action.

Hand in hand with the advance of theoretical mechanics went an improvement in machines of various kinds. The invention of the balance-wheel of the watch by Hooke, the invention of the sextant in 1731 and of the nautical chronometer in 1735, proved valuable to navigators.

More interesting were a series of inventions made by Denis Papin (1647-1712) a French Huguenot born at Blois, educated as a physician at Angers and as a scientist by Huygens in Paris. Going to England in 1680 he profited by an acquaintance with Boyle, and was admitted as a member of the Royal Society. After a short visit to Italy he became "temporary curator of experiments" for the Royal Society, but in 1688 was called to Marburg as professor of mathematics. Seven years later he went to Cassel as government engineer, and in 1707 returned to London in order to complete his steam-engine. Here he died in needy circumstances.

Distinguished by a practical rather than by a theoretical genius, he planned and constructed a series of inventions not much exploited until a century later. First, he made two air-guns, one working with compressed, the other with rarefied, air. Then he made a steam cooker, effective by the pressure applied to the top of the pot, whereby the steam was forced into the pores of the objects in it; this invention proved valuable in making jelly and in stewing fruit. Papin also preserved fruits by putting them in a vacuum; and invented a chamber for the treatment of some diseases by increasing the pressure of the atmosphere.

Next he improved the piston pump by making one in which the suction was provided by utilizing the centrifugal force of a cylinder revolving at the top. The water was admitted near the center of this cylinder and was expelled at a tangent through spiral pipes at the sides by the rapid revo-

lution of the cylinder. The principle was correct, but the pump remained impractical because of the lack of cheap power with which to turn the cylinder.

The first submarine or diving boat actually built and worked is also to the credit of Papin—though there is an unreliable tradition that a similar boat had been made earlier in the seventeenth century by Cornelis Drebbel. Papin's boat was ventilated by a centrifugal ventilator on the principle of his pump; the air was expelled by a small hole under water, the pressure of the air being sufficient to keep the water from entering. The shape of the boat was that of a small oval barrel; its size was just sufficient to admit three men. It was sunk by letting in water, and raised by pumping it out again. The boat was also provided with oars, worked by hand, and with an opening through which an enemy boat might be attacked. The boat was put into operation in 1691.

The crown of Papin's inventions was his steam-engine. This he needed to make his pump practical; and the pump, in turn, was needed by Colbert to water the king's garden at Versailles. Papin's first idea was to drive a piston out of a cylinder by the explosive power of gunpowder. The principle was right, reminding one a little of the principle of the Diesel engine in which exploded oil furnishes the motive power; but in Papin's engine the gunpowder proved dangerous and also very slow to work. He then invented a steam-engine, consisting of an iron boiler for begetting steam, and a cylinder with a piston. The water was turned to steam by the introduction of a bar of red-hot iron; the steam was then let into a cylinder by a hand cock, and, when it had raised the piston, let out by another hand cock. Though put through a successful test in 1706, in which it raised water twenty meters, it proved to be too fragile for long use, owing to the difficulty experienced in soldering together the plates of sheet-iron strongly enough to withstand the great strain applied. Contemporary with Papin, and apparently independently of him, Thomas Savery (1650-1715), a British military engineer, invented an engine

for pumping water out of mines, of much the same general type as his. This engine was but an improvement of a still earlier one patented by Edward Somerset, Marquis of Worcester, in 1663; and it was further improved by Thomas Newcomen who, in 1712, made an engine with a cylinder of 21 inches diameter, 7 feet 10 inches long, capable of making twelve strokes of the piston per minute.

Another type of engine, reminding one of a modern steam turbine, was constructed by Guillaume Amotons (1663-1705) and called by him a "fire mill." It was like a wind-mill turned by blowing steam through the fans. Amotons also made the important discovery that friction depends on the pressure as well as on the amount of surface of bodies in contact. In order to study the weather he made a hygrometer consisting of a glass tube with a bulb at one end, filled with mercury or other convenient liquid, and with a tiny hole at the bottom. This bulb was enclosed in a globe made of beech-wood, horn, or lamb's leather, that is, of some substance which expands when moist and contracts when dry. As the contractions would send the mercury in the tube up, and the expansions let it down, the maker had an instrument, though a very crude one, for measuring the amount of moisture in the air. More remarkable was Amotons's thermometer. Fixing the boiling-point of water, and learning that air, under the same pressure, varies its expansive force with heat, he proposed calculating the degrees of heat by this method. He even reasoned, correctly, that there must be an absolute zero, which he calculated at a point equivalent to -239.5 centigrade. (It is now known to be about -273.18 .)

It was Gabriel Daniel Fahrenheit (1686-1736), however, who first made fairly accurate and practical thermometers by fixing two points from which to measure. Born at Danzig, he settled at Amsterdam as a maker of glass instruments. In 1724 he sent to the Royal Society two new and improved thermometers graduated on the scale still known by his name. The freezing-point of water he put at 32; the temperature of the body at 96. He also discovered that the

boiling-point of water on his instrument is 212, and that the boiling-point of mercury is 600.

Thermometers were still further improved by Antoine Ferchault, Seigneur de Réaumur (1683-1759), who published his *Règles pour construire des thermomètres dont les degrés sont comparables* in 1730. He divided the scale from the freezing-point to the boiling-point of water into 80 degrees, and manufactured instruments so fine that they could measure very small changes of temperature. The centigrade division, now generally used by scientists, and popularly on the European Continent, was first suggested by the celebrated Linnæus, and first carried into practice by another professor at Upsala, Andreas Celsius (1701-44). A thermometer for measuring very high temperatures, hence called a "fire-meter" (vuurmeter or pyrometer) was made by Peter van Muschenbroek of a metal rod which expanded with heat and contracted with cold.

Muschenbroek, like Fahrenheit, belonged to the trade of instrument-makers called into existence by the new demands of science. Before the eighteenth, or late seventeenth, century, scientists had almost always made their own instruments. Galileo and Newton made their own telescopes, Von Guericke and Boyle their own air-pumps, Pascal his own barometer, and Papin his own steam-engine. This was necessary because there was no other way in which they could get newly invented apparatus. At most the scientist could call for help on watchmakers, jewelers, compass-makers, carpenters, locksmiths, and blacksmiths. But the ever increasing demand for instruments called into existence firms to make them, of which the most celebrated at this time was that of the Muschenbroeks in Holland. This firm specialized in air-pumps, as did that of Fahrenheit in thermometers. Presently a larger and better company of instrument-makers was started at Leipzig by a man named Leupold. His catalogue, called the *Theatrum Machinarum*, published in ten volumes beginning in 1732, describes all the instruments then known. Many of these were ingenious mechanical toys, intended to divert the amateurs of science

by exhibiting the equipoise of weights or the effects of centrifugal motion. New apparatus was constantly being invented, such as the hygrometer made of a spikelet of wild oats by Hooke; the anemometer made by the Royal Society to measure the force of the wind by a vane that would rise and fall with the velocity of the air-current; and the various bathymeters made by the Royal Society and by Hales for measuring the depth of soundings at sea. Such, also, were the artificial magnets now made by applying natural magnets to steel rods, or to cakes of iron-filings stuck together in rod-like form.

Experimentation with these magnets, wires, barometers, kites, and other mechanical toys, led to a series of important discoveries in electricity. Picard noticed that the mercury in his barometer, when carried to and fro in a dark room, became luminous. Charles François Cisternay du Fay (1698-1739) learned from an unnamed German glass-worker that not all barometers would show this effect, but only those that fulfilled certain conditions. This phenomenon became the starting-point for electrical research, in the course of which Du Fay discovered that there are two kinds of electricity, which he called vitreous and resinous, but which Franklin rebaptized with their present names, positive and negative. Stephen Gray in 1731 discovered that the conductivity of different materials varies much; he therefore divided them into two classes which he called conductors and non-conductors. He also discovered electric induction, that is, that an electric charge can be induced without contact by the mere proximity of another charged body. A Leipzig professor named Hansen described the three kinds of electric discharge—spark, brush, and glow.

Experiments with electricity were much hampered, in this early stage, by the inability of physicists to get a high charge. For, with the instruments then known, as soon as an electric charge exceeded a very small amount, it would discharge itself to another body near it, or even into the air. This difficulty was remedied by Peter van Muschen-

broek, who conceived the brilliant idea of enclosing a charged body in an insulating shell. He succeeded in doing this in 1746 when he filled a glass with water and plunged in it a brass wire which served as a conductor from an electric machine. As he held the glass in one hand and approached the wire with the other, he received a shock so violent as to frighten him and at the same time to apprise him that he had found a method of storing large quantities of the electric fluid. His experience led to the invention, by Cathedral Dean Ewald Jürgen von Kleist, of the Leyden jar; that is, of a glass jar lined inside and outside with metal sheets; this instrument he called "the thunder-maker" (*instrumentum brontopœum*).

It remained, however, to prove experimentally that thunder and lightning were really, what they appeared to be, electric phenomena. This was done by Benjamin Franklin (1706-90), the first American to make an international reputation. Self-educated and self-made, versatile, optimistic, practical, benevolent, and tireless, he became, in the eyes of Europe, the first embodiment of the American character. He was also typical of one large aspect of his age, of the popular, democratic, and utilitarian side of the Enlightenment. At a time when science was in the air, he contributed importantly to science. In the age when journals were beginning to absorb a large portion of the attention of the reading public, he was a brilliant journalist. In those great days of rationalism and humanitarianism he was the tireless preacher of reason, of prudence, and of kindness. In the first age of popular education, he did much to foster and to supply the demand for it. In the formative period of modern democracy, he was the typical democrat. In the adolescence of America, he was the representative American.

It is indeed in statesmanship and diplomacy that he won his highest triumphs. The public life was then seductive to many of the great thinkers and writers of Europe. Many of them, like Voltaire and Burnet, rendered themselves almost ridiculous when they dabbled in politics. Some of them, like Newton and Leibniz, rendered important public

services; but it is not to undervalue these services to say that they were as far inferior to those of Franklin as were his contributions to science and philosophy inferior to theirs. Indeed, no statesman among his contemporaries, neither Frederick the Great, nor Peter the Great, nor Charles XII, nor Walpole, nor Vergennes, has to his credit successes as astounding as those of Franklin in unifying and in liberating the American nation. To evaluate these services to his country, however, lies outside the province of the present work. In this chapter only his scientific discoveries, and in other chapters, his contributions to other branches of culture, are considered.

Benjamin Franklin was born in Boston, as one of the many children of a printer. Beginning life as a journalist and printer, he became an ardent Whig and a no less ardent Deist after a visit to London at the age of twenty. Like Voltaire, he took back from England the latest ideas on religious and political freedom. Soon after his return he settled in Philadelphia, where he made himself wealthy as a printer and much respected as a public servant. The beginning of his continental, as distinct from his provincial, political career was his appointment as Postmaster General of America in 1753. In 1757 he again visited England, and made an extensive tour through Holland, Germany, Italy and, later, France. Elected to the Royal Academy in 1756 and to the *Académie des Sciences* in 1772, his achievements were bruited over Europe. His manners, his dress, his philosophy, became the rage in France and in other parts of Europe. He was compared on the one hand to Voltaire and on the other to Christ. In the winged hexameter of Turgot he was declared to "have snatched the thunderbolt from the heavens and the scepter from the tyrants."³³ On his death Mirabeau proposed public mourning for him in the following eloquent words:

Franklin is dead! The genius that freed America and poured a flood of light over Europe, has returned to the bosom of Di-

³³ *Eripuit cælo fulmen sceptrumque tyrannis.*

vinity. The sage whom two worlds claim as their own, the man for whom the history of sciences and the history of empires contend with each other, held, without doubt, a high rank in the human race. . . . I propose that it be decreed that the National Assembly, during three days, shall wear mourning for Benjamin Franklin.

This vast reputation was first founded on his experiments with electricity. As soon as he heard of the Leyden jar he made one and began experimenting with it. He soon discovered that "points have a property by which they can draw on as well as throw off the electrical fluid at greater distances than blunt bodies can." Charging a cylinder with electricity he found that a sharply pointed pin would draw a spark when held twelve inches away; but that the head of the pin, or other blunt iron, if similarly presented to a charged body, would draw no spark under four inches. He compared the action of the points to the operation of plucking hairs from a horse's tail; if the hairs be plucked one at a time, as the fine point takes the electricity, they can all be plucked out; if all are grasped at once, as the blunt iron seems to grasp at the electric fluid, they come out much harder. In 1752 he demonstrated the identity of lightning and electricity by flying a kite during a thunderstorm. The electric charge, passing down the wet string, was plainly visible in the sparks drawn off at the bottom by a key. With his usual practical genius, he then invented the lightning-rod, a long metal wire with a sharp point intended to draw off the lightning innocuously and gradually and thus to protect the building to which it is attached from the dangers of the thunderbolt. As the danger from lightning is small, and as Franklin's rod furnishes incomplete protection, it has fallen somewhat into disuse. It is true, however, that complete protection can be secured by erecting around a building a mesh of rods ending in very sharp points and well connected with the ground.⁸⁴

Franklin's first discoveries were communicated by him to his English friend, Peter Collinson, who published them un-

⁸⁴ F. A. Saunders: *A Survey of Physics*, 1930, 315.

der the title *Experiments and Observations in Electricity made at Philadelphia in America*, in 1751. The intense interest excited by this book led the French naturalist Buffon to translate it into his own tongue. It was also translated into German, Italian, and Latin, and received a medal from the Royal Society. Many scientists have recognized the fine quality of Franklin's contributions to science. Sir Humphry Davy spoke of his "singularly happy induction," and Professor J. J. Thompson confessed that he was

struck by the similarity between some of the views which we are led to take by the results of the most recent researches with those enunciated by Franklin in the very infancy of the subject.

What first strikes the lay reader of Franklin's works, however, is the keen inquisitiveness of his versatile and practical mind. He could never see anything without investigating it. He dipped into physics, meteorology, natural history, geology, chemistry, mechanics, agriculture, medicine, and mathematics. He studied magic squares, the weather, the bones of prehistoric animals, the absorption of heat by cloth of various colors, and the behavior of oil poured on water. He suggested daylight-saving, air-bathing, bifocal glasses, and the use of thermometers to test ocean currents, rightly assuming that those flowing from the south would be warmer and those coming from the north colder than the average temperature of water in any given latitude. He invented the stove still known by his name, a stove with one side open like a hearth, but set in the middle of the room. It combined the cheerfulness of the open fire with the efficiency of the old closed stove.

7. CHEMISTRY

While astronomy, mathematics, and physics were winning victories under the leadership of the greatest of scientists, chemistry failed to find its Newton. Or, rather, even with Newton it was unable to achieve as much as did its sister sciences. For, the Cambridge professor spent more time

and thought on chemistry than he spent on other branches of knowledge, and with less result. That this is so is a striking illustration of the established fact that progress in a particular science depends less on the accident of genius than on the state of knowledge at the time. The advance of science is like a war on an extended front, such as we saw in the world conflict of this century. The easiest salients are first attacked and won; the possession of these gives the key to other positions; the conquest of one strategic post leads on to another, until finally the whole line is pushed forward. So it is that a discovery in one science suggests the solution of problems in other fields of research. The gradual perfecting of experimental technique, the acquisition of new knowledge in a neighboring domain, the forging of new and more powerful mathematical tools, the stream of attention, the practical urgency with which certain problems are presented for solution—all these and other factors condition the advance of any given discipline, and give to each its own historical uniqueness.

In the late seventeenth century chemistry was defined as the art of discovering what mixed substances are made of.⁸⁸ Fifty years later Boerhaave described it more precisely as "the art of changing bodies by solution or coagulation . . . either separating parts before united or uniting parts before separated." The substances selected for examination were usually inorganic, though certain organic materials, such as sugar, wine, soap, opium, turpentine, manna, camphor, paper, tartar, and tobacco were examined. The laboratory was furnished with primitive instruments, of which the most common were furnaces, bowls, retorts, glue, string, sand, and glass tubes. Fire and water did most of the work of solution and analysis.

The prevalent theory of chemical composition was the atomic, born in antiquity, revived during the Great Renewal, and handed on to more recent times. Newton expressed this theory in the following passage at the end of his *Optics*:

⁸⁸ Lemery: *Cours de Chymie*, 1675, quoted Hjelt, 16.

It seems probable to me that God in the beginning formed matter in solid, massy, hard, impenetrable, movable particles, of such sizes and figures, and with such other properties, and in such proportion to space, as most conduced to the end for which he formed them; and that these primitive particles, being solids, are incomparably harder than any porous bodies compounded of them; even so very hard as never to wear or break in pieces; no ordinary power being able to divide what God himself made one in the first creation. . . . It seems to me, farther, that these particles have not only a *vis inertiae*, accompanied with such passive laws of motion as naturally result from that force, but also that they are moved by certain active principles, such as that of gravity, and that which causes fermentation and the cohesion of bodies.

Though he published little or nothing on chemistry except a tract on the *Nature of Acids*³⁶ Newton spent years in thought and observation of chemical phenomena. On chemical affinity he made the following suggestive comment:

It's well known that bodies act upon one another by the attractions of gravity, magnetism, and electricity; and these instances show the tenor and course of nature, and make it not improbable that there are more attractive powers than these. . . . When salt of tartar runs *per deliquium* is not this done by an attraction between the particles of water which float in the air in the form of vapors?

He argued further that the heat produced by mixing water and oil of vitriol proceeds from a great motion of the parts, and this in turn from a violent coalescence of the particles of the two liquids rushing towards each other under an attractive force.

Neither the atomic theory nor the possibility of intrinsic attraction was admitted by all scientists. Euler denied both on *a priori* grounds, dangerously assuming that the material world of matter must correspond exactly to the ideal world of mathematics. Thus he argued that matter must be infinitely divisible because number is infinitely divisible. Attraction he rejected because it contradicts the inertia which

³⁶ *De Natura Acidorum, Opera*, iv, 397.

he considered an original property of all bodies. Gravitation is due, said he, not to the attraction of particles for each other, but to the mechanical pressure of the surrounding ether. Though he refused to admit the existence of atoms—that is, of ultimate and indivisible particles—he believed that matter is composed of small corpuscles of different sorts. The uniqueness of every object known to us is due partly to original differences in the corpuscles of which it is composed, and partly to their different arrangement.³⁷

Tired of arguing about the atomic theory, which they could at that time neither prove nor disprove, chemists turned their attention to elucidating the phenomenon of combustion. To explain this they evolved the phlogiston theory, the rise and fall of which constitutes the major portion of the history of chemistry during the Enlightenment. The author, or at least the baptizer of the theory, was Georg Ernst Stahl (1660-1743) a German physician. Admitting the existence of atoms, he held that they could never be isolated, even in mass, but could be known only by the qualities they impart to compounds. The inability of men to isolate atoms he attributed not only to the imperfection of instruments but to the nature of the atoms. But the qualitative, quantitative, and mechanical differences of atoms, said he, can be perceived by studying the compounds of which they form parts. There are, he continued, four kinds of earth, or elements. The first of these, vitrifiable earth, is the underlying substance, or hypostasis, of corporality; the second earth, which is sulphurous, imparts combustibility to substances in which it occurs; the third, or mercurial earth, gives density to metals and other qualities to animals and vegetables; the fourth substance, water, gives liquidity to things. These substances Stahl believed never to exist alone, but always in various combinations formed by chemical affinity, of which he had a distinct idea.

Giving the name “phlogiston” from the Greek word meaning “flammable,” to the second earth, Stahl proposed to show that it is not, on the one hand, a metaphysical idea

³⁷ Euler: *Opera Omnia*, Series III, vol. i, 3 ff.

without material reality (as some thinkers had held) nor yet a gross substance identifiable with sulphur (as had been recently proposed). In his thought it was a true, concrete element, but one not to be found isolated, and hence not identical with any substance known by sight. Though the theory has been rejected in modern times, it led its inventor to make important discoveries, of which the chief was that combustion and calcination of metals are analogous processes. Comparing the metallic calx to the ash of burnt substances, he showed that this calx, mixed with oil, or resin, and stirred, would reunite with the metal from which it had been derived. From his experiments he deduced that the combustible part, or phlogiston, could be transferred from one body to another. Confronted with the fact that calcinated metal gains weight, Stahl felt embarrassment; but he came near the thought that matter may be diffused through the air (as in burnt substances) or derived from it (as in calcination).

For a hundred years after Stahl proposed this theory chemists labored to explain by it the phenomena of combustion and calcination. Some of them believed that they could identify phlogiston with some known substance. One school held that alcohol (then thought to be a mixture of acid, oil, and water) is phlogiston; another that it is sulphur; another that it is the gas now known as oxygen; and a fourth identified it with light. Newton and his followers held light to be a corporeal substance, emitted in small particles from luminous bodies. What more natural than to identify this with the fire which makes bodies hot and luminous at the same time? Flame would then be nothing but visibly escaping phlogiston.

Some of these ideas are found in the text-book, called the *Elements of Chemistry*, written by the Dutch physician Hermann Boerhaave (1668-1735). This learned and lucid treatise, first published from lecture-notes by his students in 1724 and later (1732) more perfectly printed by himself, attempts to explain chemical phenomena on Newtonian principles. Without using the word phlogiston, he explained fire

as a material substance which, by inserting itself between the corpuscles of other substances, forces the corpuscles apart. Alcohol, which burns without leaving an ash, he thought to be the combustible substance *par éminence*. Admitting chemical affinity, he illustrated it by saying: "There is, between each particle of gold and each particle of *aqua regia* (nitro-hydrochloric acid) a virtue which makes them love each other, unite with each other, and mutually hold to each other."

As this attraction could not be explained on Newtonian principles it was rejected by the more devoted disciples of the master. Buffon, in particular, asserted that chemical affinity could be explained on the law of inverse squares, that the combustible principle in matter is Newtonian light, and that therefore all particularly resplendent objects, like the diamond, must be combustible even if we can not, in practice, burn them.

Much more valuable than these *a priori* speculations were the painful experiments of patient observers. The first tables of chemical affinities were sent to the Parisian *Académie des Sciences* in 1718-20 by Étienne François Geoffroy. These tables clearly showed that some substances attract others in a way inexplicable on the law of inverse squares, and that some substances unite easily and others do not.

Still pursuing the track of phlogiston, various chemists made important discoveries of gases. Though the word "gas" dates from Van Helmont, the thing itself was not caught and studied until a Scotch physician and professor at the University of Edinburgh named Joseph Black (1728-99) made, in 1754, some experiments on *magnesia alba*, which he distinguished from limestone. On being heated this substance transformed itself into lime and in doing so gave off a gas; Black therefore concluded that *magnesia alba* is a compound of quicklime and this gas. Further experiment showed him that quicklime and alkalis have causticity when deprived of this gas and lose their causticity when they reabsorb it. This gas, now known as carbon dioxide, or car-

bonic acid gas, he called "fixed air." He also made, in 1763, the important discovery of latent heat.

Another very important discovery of a gas was that of oxygen by a Unitarian clergyman of Yorkshire, named Joseph Priestley (1733-1804). By heating mercurius calcinatus he obtained a special kind of air, superior to ordinary air in that it sustains the flame of a candle and the life of an animal longer than ordinary air. This "dephlogisticated air," as he called it, he discovered in 1774.

The next year Karl Wilhelm Scheele (1742-86) wrote a work on *Air and Fire* which was published in 1777. In this he showed that air has two components, which he called "fire-air" (oxygen) and "spoiled air" (nitrogen); the former he defined as "an elastic fluid, consisting of an inelastic foundation or saline principle, of a certain small quantity of phlogiston, and of a certain quantity of water." Thus we see that the phlogistic theory still held its own, though it was soon to be overthrown by Lavoisier, the founder of modern chemistry.

CHAPTER III

LINNÆAN SCIENCE

I. GEOGRAPHY AND GEOLOGY

The history of science would seem to show that man's mind apprehends best that which is most remote from itself both in physical distance and in emotional content. The first branch of study to arrive at a high degree of maturity was that which dealt with the heavenly bodies; the next, that which dealt with the pure abstractions of numbers; the third, that which measured the force of moving bodies and analyzed the light. Somewhat later the earth and its inhabitants, vegetable and animal, were brought under the sway of science; last of all the phenomena of human society and of the human mind are destined to conquest. The period of the Enlightenment saw enormous advances in mathematics, physics, and astronomy, in all three in the perfection of theory and in the later two in the accumulation of new facts. But the sciences of geography, geology, biology, and physiology, while accumulating and digesting a large amount of new material, groped in vain for a law, or theory, which should bind the facts, in any particular field of reference, in a helpful generalization. Theories indeed abounded, but, as they were premature and arbitrary, none of them had the validity or the heuristic value of the law of gravitation or of the wave-theory of light.

Many of the new facts accumulated by the descriptive sciences originated in the continued and active exploration of the earth. Only in the eighteenth century was the Pacific tolerably well explored. This vast sheet of water, covering half the surface of the globe and studded with a galaxy of archipelagos, though crossed by Magellan in 1520, long

proved resistant to the limited speed of sailing ships. When fifty miles was the average day's journey of a vessel, the time consumed in exploration was immense. When the theory of vitamins and the use of antiscorbutics were both unknown, a long voyage proved terribly dangerous to the health and even to the lives of the crew. Add to this the perils of rocks and uncharted reefs, of icebergs and intense cold, and sometimes of insalubrious climates, of poisonous foods, and of hostile natives, and one sees why the tale of exploration is one of suffering and heroism.

Among the buccaneers and pirates who searched the seven seas for trade routes to infest and for islands and bays in which to hide, some added to geographical knowledge and a few graduated into honorable employment. Such a one was William Dampier who, as a rover of the sea, visited the Galapagos in 1683 and Oceania in 1688-91. The narrative of his voyage, describing the natives of New Holland (Australia) as "the miserablest people in the world, poorer even than the Hottentots," aroused so much attention that the British government in 1699 put him in command of one of the first vessels ever sent out solely for the purpose of adding to knowledge. With this he explored Australasia and the coasts of New Guinea. With the formation of the South Sea Company in 1711, a number of privateers were dispatched to prey upon the king's enemies in the remote seas. Some of these, as well as similar French and Dutch sailors, added to geographical lore. Of the French commanders the most notable was Lozier Bouvet, who in 1738 navigated the Pacific; of the Dutch, Commodore Roggeveen, who discovered Easter Island in 1722, deserves mention.

When the Treaty of Paris, in 1763, had checked the motive for privateering and had lessened the dangers to peaceful navigation, more systematic exploration was undertaken by various governments in the interests of empire, trade, and science. The very next year the British sent Captain John Byron to explore the Falkland Islands in the Atlantic and other archipelagos in the Pacific. Two years later Captain Samuel Wallis circumnavigated the globe, with valuable

results. In order to determine the truth of the legend of Patagonian giants—a legend perhaps arising in the discovery of the bones of some gigantic extinct reptile—he measured the inhabitants of South America, and found that the tallest man did not exceed five feet seven inches in height. He first discovered Otaheite (Tahiti) in the Society Islands, and described its charms to his countrymen. He also explored Australasia.

In this same year, 1766, the French commissioned a man of scientific interest and achievement, Louis Antoine de Bougainville, to sail to the Pacific in search of new facts of value to science, and equipped him with a staff of experts, including a botanist and an astronomer. He visited Tahiti a few months after Wallis; and then Samoa and other islands.

The desire of the Royal Society to observe the transit of Venus from all quarters of the earth led to the fitting out of an expedition to the South Sea under the command of one who was destined to prove the most famous of all English explorers. James Cook (1728-79), the son of a Yorkshire laborer, was educated at a common school and apprenticed to the sea in 1746. Rising rapidly in his profession, he was wisely selected to lead a scientific expedition to the Society Islands in 1767. With him went the astronomer Joseph Banks and the biologist Solander, a pupil of the great Linnæus. After the astronomical observation had been duly recorded at Otaheite, the coasts of New Zealand, New Holland (Australia), and the East Indian Islands were visited and charted.

Even more important was the second voyage of Captain Cook, undertaken with two ships (1772-75) with the purpose of solving the problem of the Antarctic continent, which was then generally believed to be enormously larger than it really is. Sailing first to the Cape of Good Hope, Cook then struck due south until the icebergs—or, “ice islands,” as he called them—made it too dangerous to proceed further. Then turning north, he again visited New Zealand, Otaheite, and other Pacific islands.

A third voyage (1777-79) purposed to solve another geographical mystery, the relation of North America and Asia at their points of nearest approach in the Arctic Circle. Until 1775 no Spaniard, or other national, had followed the western coast of North America further than the site of San Francisco; in that year a Spanish vessel penetrated to the latitude of $56^{\circ} 47'$. On the Asiatic side the Russians had made some discoveries presently to be described. On his third voyage, along the coast of Alaska and the Aleutian Islands, to Behring Sea, Cook met some of these Russians who gave him further information about the Asiatic coast. Turning south again, he came to Hawaii, where he was first worshipped as a god by the natives, and then killed in a fight with them. His fame rests secure on the great sweep of his voyages, which circled the earth and extended from the Arctic to the Antarctic. Daring, humane in his treatment of barbarian races, skillful in his profession, careful of the health of his crew, intelligently interested in observing everything, and capable of recording his adventures in sober but thrilling narrative, he deserves a high place among those who have extended the boundaries of the empire of man.

While bold sailors were opening up the water hemisphere to European eyes, travelers were penetrating and mapping the unknown, or imperfectly known regions of the land. Except for a few short expeditions of the Dutch in South Africa, little was done to examine that continent. James Bruce, indeed, in 1768 sailed up the Nile and the Blue Nile to the headwaters in Abyssinia; but, as this had been done before, little was added to the stock of knowledge. An expedition fitted out by King Frederick V of Denmark to explore Arabia in 1762 came to a disastrous end. Of the numerous staff of scientists, including a botanist, a linguist, a zoölogist, an artist and a surveyor, only the last, Carsten Niebuhr, survived the rigors of the climate.

Much more important results were secured by the expansion of the Russian Empire in Asia and of the French, Spanish, and English dominions in America. Under the auspices of Peter the Great scouts were sent to spy out the

land of Siberia and to prepare it for colonization. One of them, Atlassof, in 1697 reached Kamchatka; while another, the German naturalist Messerschmidt, in Russian service, mapped large portions of the vast interior. Before 1725 Czar Peter had appointed Vitus Behring, a Dane by extraction but a captain in the Russian navy, to explore the northeastern coast of Asia. When his party, including an astronomer, a naturalist, and a historian sent by the St. Petersburg Academy of Sciences, assembled at Okhotsk in 1727, Behring built a ship and spent fifteen years in a series of voyages which thoroughly opened up the till then obscure geography of the strait between Asia and America, and which, incidentally, secured Alaska to the Russian crown. The strait was named after the great navigator, who, together with many of his crew, succumbed to the scurvy and to the other fearful hardships then attendant upon long voyages. The exploration of Asia did not cease with his death, however; for Catherine II took up the task, sending an expedition to observe the transit of Venus in 1769 to the Great Caucasus, and others which mapped the region of the Caspian.

Compared to the vast distances covered by the Russians in their march eastward, the westward expansion of the Spanish, French, and English in America seems slow and timid. In Latin America little was done to survey the country; of that little the most important results were secured by the Jesuit Father Kühn who, in the years from 1683 to 1702, opened the regions of Upper and Lower California. To the northward the French bore the burden of exploration until about the middle of the century, after which the British Americans took it up. From Quebec in the North and from Louisiana in the South, the French sent out soldiers and missionaries in the grandiose endeavor to establish an empire which should completely surround and hem in the English colonies on the Atlantic seaboard. Several expeditions were also sent to the far west, with the purpose of reaching the Pacific; but of these the one which went furthest, that of

the brothers La Vérendrye in 1742, penetrated only as far as the sources of the Missouri.

When the French colonial empire was attacked by the British, and when Canada was ceded by France to the British crown (1763), the tasks of exploration fell into the hands of the conquerors. As early as 1754 Anthony Hendry had explored Hudson Bay. Fifteen years later Samuel Hearne followed him to the northern water, and also by land marched westward as far as Great Slave Lake. During these years (1766-69) Jonathan Carver of Connecticut ascended the St. Pierre (Minnesota) River, and explored the whole region between the Mississippi and Lake Superior. His noble and fascinating *Travels Through the Interior Part of North America* (1778) contributed valuable materials on Indian manners, customs, religion, and languages.

Less extensive but more thorough was the work of the frontiersmen who conquered, for civilization and for the Thirteen Colonies, the region lying just west of the Alleghenies. It is hard to realize that less than two hundred years ago the region now occupied by the populous and civilized commonwealths of Ohio, Michigan, Kentucky, and Tennessee, not to mention those further west, was a wilderness less known in detail than are the wildest parts of Africa and of South America today. George Croghan, an Irish settler in Pennsylvania, first surveyed the Ohio (1747-65), while Dr. Thomas Walker, of Virginia, discovered the Cumberland Gap and explored Kentucky. These first pioneers were followed by a race of adventurers intent upon settlement as well as upon investigation. Such frontiersmen as George Rogers Clark and Daniel Boone, daring, hardy, self-reliant, and resourceful, began with ax and rifle to clear the wilderness and with sextant and theodolite to survey the land. George Washington himself, though by inheritance a planter with great possessions, and though by genius a soldier and statesman, was by training and profession a surveyor—one of the numerous band who prepared the country for civilized habitation. Long before the War of Independence the conflict of views and of interests between

the British government and the colonial settlers gave a spice of rebellion to the westward urge. The impolitic act of the imperial administration in proclaiming the territory north-west of the Ohio River an Indian reservation closed to settlement, aroused passionate resentment in the colonies and led to the expedition of George Rogers Clark who, in 1778, conquered the region for civilization and for the United States.

Hand in hand with the acquisition of new geographical knowledge went the perfecting of cartography which made it, during the eighteenth century, for the first time an exact science. In the theory of surveying and in the astronomical determination of latitude and longitude as well as in the principles of projecting a spherical surface on a plane, the French and Germans made equally important advances; in the art of engraving and in the thoroughness with which they depicted their whole land, the French took the lead. The most ancient method of determining position on the surface of the earth had been the astronomical; but until Bradley's discovery of the aberration of light and of the nutation of the pole, and until the invention of J. Harrison's chronometer (1764), this method had suffered from unavoidable inexactitude. While the astronomers hereafter made observations with a high accuracy, surveyors perfected the method of triangulation by which, on a given base, the lay of the land was determined with great nicety. Altitudes of mountains were measured more exactly by barometers and by the improvement of surveying following the invention of the water-level. Maps began to indicate elevation by shading, to make profile-charts and panoramas, and to insert scales of measurement. The mathematicians Euler and J. H. Lambert created an exact doctrine of projection, while the engravers improved the arts of hatching and of coloring. All these advances in art and in science combined to make the atlases of the eighteenth century beautiful, informing, clear, exact, and full, beyond anything that had preceded them.

At the head of the new school of cartography stands

Alexis Hubert Jaillot (1632-1712) a native of Franche-Comté who came to Paris in 1657 to join a firm of publishers and map-makers. Appointed Royal Geographer in 1675, he published a notable *Atlas Nouveau contenant toutes les parties du Monde*, in 1689, and kept it up to date by engraving new maps as required by successive editions. He also published an atlas of maritime charts in 1693. In 1708 he began to publish a postal directory of France,¹ accompanied by maps, which was continued annually, long after his death, by his sons. The beautiful and detailed maps in this series were embellished with *cartouches*, or title-panels, drawn with details to illustrate the natural features, industries, and produce of each region.

Fine as were these maps they were far surpassed by those prepared by the Cassinis, members of that famous family which for four generations supplied France with astronomers. The third of this dynasty, César François Cassini, Comte de Thury (1714-84) began and his son completed a survey of the whole of the kingdom, except Brittany, by erecting four hundred triangles on eighteen bases. The first of these maps,² which shows the triangles on it, appeared in 1744, and was followed by others drawn on the same scale, of about 1.33 miles to the inch, until the whole country, except Brittany, was portrayed in a map thirty-six feet square. These maps show all the natural features of the landscape as well as the roads, towns, abbeys, farms, forests, vineyards, and mills, and even the crosses and gallops then scattered along the wayside.

Another series of road-maps was prepared by the Cassinis with the purpose of guiding travelers. After the organization of the department of Roads and Bridges in 1716, the French government, with the aid of the *corvée*, or forced labor, built a magnificent series of roads, the utility of which was greatly increased by Cassini's fine and delicate designs.

The Austrian Netherlands alone could rival France in the

¹ *Liste générale des postes de la France*, annually 1708-79.

² *Nouvelle Carte qui comprend les principaux triangles qui servent de fondement à la description géométrique de la France.*

excellence of her roads and in the beauty of her maps. Comte Joseph de Ferraris (1726-1814), a noted soldier and a favorite courtier of Maria Theresa, prepared a series of Belgian maps of extraordinary accuracy and detail. With each sheet was annexed a memoir giving historical, military, geological, agricultural, and economic information.

Germany, too, had excellent cartographers, especially after the foundation of the Cosmographical Society in 1740 at Nuremberg. J. B. Homann engraved fine maps of Germany and of other countries in this city; while the Jesuit Scherer rivaled him in a great atlas of the world, published at Augsburg, Dillingen, and Frankfurt-am-Main in 1710.

Towards the end of the seventeenth century John Ogilby's *Britannia* furnished for England and Wales a series of road-maps frequently re-issued and used by all travelers until the railroads made them obsolete in the middle of the nineteenth century. As a great maritime nation England produced many charts of the sea, of which Seller's *Hydrographia Universalis* (c. 1690) may serve as an example. The great London cartographer of the early eighteenth century was Herman Moll, a Dutchman who came to England about 1698 and produced vast numbers of maps. His *System of Geography, or, a new and accurate Description of the Earth in all its Empires, Kingdoms, and States, illustrated with History, Topography, and Maps*, appeared in London in 1701. Much fuller was a work founded on this, entitled *The Compleat Geographer*, published in 1723. Beginning with an account of the stellar universe, and with a natural history of metals, fossils, and the sea, it continues with descriptions of every country of Europe, and contains excellent maps of all parts of the known world. Those of Europe, while not equal to the French engravings, are fairly good; while the maps of Asia and Africa give only an idea of the outlines and larger features of those continents. The maps of North and South America are good for the settled regions, but blank in unexplored portions; while there is nothing on Oceania, the Pacific, or the lands near the poles.

Moll also published separate charts of North America and Asia, at various times. The first maps that give a good idea of the coasts of Australia and New Zealand were probably those published in Cook's *Voyages* in 1779.

Temporary failure and final success met the efforts of the geographers and physicists of this age to determine the exact shape of the earth. As early as 1672 the French scientist Jean Richer, at Cayenne, noticed that a pendulum clock that kept exact time at Paris, ran slow in South America. With brilliant insight he explained the slower beat of the pendulum as due to the lesser intensity of gravity near the equator than in the higher latitudes. The deduction, that the earth is not a perfect sphere but an ellipsoid flattened at the poles, though approved by Newton, was cast in doubt by an incorrect measurement of the Cassinis, who thought they found that the degrees of the meridian diminish in length as one travels from the equator to the poles, which would imply that the shape of the earth is an ellipsoid elongated, instead of flattened, at the poles. After much argument the French *Académie des Sciences* sent two expeditions, one to the equator and the other to the far north, to make new measurements. While Godin, Bouguer, and de la Condamine went to Peru to determine the length of an arc of the meridian, Maupertuis and Clairaut journeyed, for the same purpose, to Lapland at the top of the Gulf of Bothnia. The discovery that a degree of latitude near the equator measures 363,800 feet, and that a degree of latitude near the Arctic Circle measures 367,100 feet, finally settled the question in favor of the Newtonians, and proved the flattening of the earth at the poles. The result, hailed as another triumph of mathematical science, sent a thrill throughout Europe, and was celebrated by Voltaire in sounding verse:

Heroes of science, hail! like Argonauts ye brave
The dangers of far climes, the perils of the wave;
Your measurements exact and arduous give birth
To the true knowledge of the figure of the earth.

As Geography reached maturity, her younger sister Geology was born. The first considerable *Essay toward a Natural History of the Earth* was published, under that title, by John Woodward (1665-1728) in 1695. Visiting caves and wells, diligently considering various sorts of earth and of ore, and sending circular inquiries to correspondents in other lands not only of Europe but of Asia, Africa, and America, he discovered the two fundamental facts that in all countries "terrestrial matter" lies in strata, and that some of these strata, in all parts, are filled with fossil sea-shells. While further observations by J. G. Lehmann in Berlin and by Arduino in Venice, confirmed these deductions, the philosopher Leibniz, recognizing the difference between igneous and aqueous rocks, sketched a theory of the passage of the earth from an original incandescent state to its present condition of a supposed molten kernel with a cool crust. D'Alembert subjected to mathematical analysis the hypothesis of a globe containing a kernel of different density from that of the shell. Attempts were made by Lehmann and G. C. Füchsel to estimate the age of the earth by measuring the effects of deposit and erosion. Especially after the disastrous earthquake at Lisbon in 1755 various scientists studied this phenomenon, without greatly advancing the theory of it. John Mitchell (c. 1724-93), however, recognized that certain places are liable to recurrence of earthquakes, that regions near volcanoes are the most subject to them, that the movement of the earth in a quake is partly tremulous and partly undulatory, and that a likely cause of the explosion is the contact of subterranean fire and water. These conclusions were published in the *Philosophical Transactions* in 1761, some years after Buffon had enunciated his famous theory of the earth.

George Louis Leclerc, Comte de Buffon (1707-88) was the son of a councilor of the Burgundian Parlement. After studying law at Dijon and medicine at Angers, he was enabled by inherited wealth to devote himself to natural sciences. His first interests in mathematics and physics were turned to the study of natural history by his appointment,

in 1739, keeper of the Royal Garden (now called the *Jardin des Plantes*) at Paris. This fine collection of animals and plants, which he much improved, gave him an excellent opportunity to observe nature, while his engaging personality and high social position offered him a conspicuous platform from which to expound his observations and theories to an eager public. In 1749 he published his *Théorie de la Terre et vues générales sur la génération et sur l'homme*; twelve volumes on *Quadrupeds* followed in the years 1753-67; nine volumes on *Birds* in the years 1770-83; five volumes on *Minerals* 1783-88; and seven volumes of supplements, of which the most important was that entitled *Époques de la Nature*, in the period 1774-79. The whole grandiose series was republished, with the order of the parts somewhat changed, as the *Histoire Naturelle*. All the material was not from the pen of Buffon. Associated with him was Louis Daubenton (1716-1800), a professor at the Collège de France, who wrote the chapters on anatomy.

The exact degree of Buffon's scientific achievement is difficult to assess. He has been praised where he should have been blamed and blamed where he should have been praised. First, the specialists attacked a natural history which they branded as "not natural enough" and as a philosophical romance. Then the publicists calling themselves "the philosophers" fell upon one who refused to take an active part in their propaganda of enlightenment. Some of his theories seemed too daring, some too timid and some—especially his attempt to reestablish spontaneous generation—were positively reactionary. On the other hand, he discovered some new truths, and propounded some theories which, once rejected, are now coming into their own. From his education and environment he had imbibed the correct scientific method; he knew that he "must assemble facts and give birth to ideas"; that truth could be obtained only by rational, delicate, and persistent experiment; that the search for it must be conducted without preconceived ideas, in order to ascertain the "how" and the "how much." Thoroughly convinced of the reign of natural law, he recognized

this natural law for what it is, a product of observed facts.

But in practice he fell short of his own ideal; defining genius as "long patience," he sometimes failed to have patience long enough. What really seduced him from the austere beauty of truth was his love for the meretricious charms of popular success. Capable of resisting the pressure of prejudice, he fell a victim to his own rhetoric. For a scientist his doctrine of style—that "one should not be so carried away by the love of precision as not to employ the effective [literary] word"—is extremely dangerous. Writing for the cultivated public he mixed sentiment with science, talked of the virtues and vices of animals, attributing to them sobriety, fidelity, laziness, libertinism, or chastity, as suited a moral, rather than a strictly objective, purpose. But, after all, it is worse than futile to blame a great man for what he is not. If Buffon just missed being a great scientist he won the glory, equally legitimate in its own sphere, of a great writer.

His doctrine of the formation of the earth is daring, brilliant, and consistent. His theory that the planets originated in the collision of a comet with the sun, though much denounced, really bears a fairly close resemblance to the hypothesis advanced by such eminent astronomers as Jeans and Eddington now, that the planets originated in the pull exerted by a heavenly body approaching the sun. Originating as a fragment of the sun, Buffon continued, the earth was once molten and must have cooled down. As it could not possibly have done so in the six thousand years then given it by theologians, it must have taken the much longer period of about 75,000 years. If this calculation of the age of the earth is really absurdly short, nevertheless it represented, for the time it was made, a bold and determined effort to see nature whole, an effort which was carried out in a scheme of the six ages of the world, as follows: 1. Formation of the planets. 2. Cooling and consolidation of the earth from molten matter. 3. Period during which waters covered the earth. 4. Period when elephants and other tropical animals inhabited northern countries. 5. Pe-

riod of the separation of the continents. 6. Period of man's existence.

Connected with this general sketch of the natural history of the globe are extended discussions of mountains, seas, islands, rivers, minerals, rocks, and other inorganic substances. Particularly rational is the treatment of fossils. Whereas earlier scientists like Woodward had attributed the abundance of these sea-shell formations on land to the Biblical deluge, Voltaire, with equal and opposite religious bias, had suggested that they had been dropped by pilgrims at the time of the Crusades. Buffon recognized both explanations as wrong, and correctly stated that they must have been formed during some long and remote geological period, antecedent to man, when the ocean covered the continents.

2. BIOLOGY

The botanical and zoölogical work of the period of the Enlightenment was descriptive and taxonomical. While the new continents yielded many hitherto unknown species of plants and animals, those already known were more carefully studied, and the many species classified. Though a considerable amount of fresh fact was thus assimilated, and though some new ideas were put into circulation, no method of classification proved generally satisfactory, and no theory marked an epoch.

One of the best botanists of the time was John Ray (or Wray, 1627 or 1628-1705) the son of a blacksmith of a village in Essex. His father's prosperity, unusual in his calling, allowed Ray to matriculate at Cambridge, where he studied the classics, theology, mathematics and natural science, and where he graduated in 1649. After twelve years of teaching, and after taking holy orders, he refused to subscribe to the Act of Uniformity of 1661, and hence lost his college position. He then became a private scholar in the service of a rich young man, his pupil and friend, Francis Willughby who, dying in 1672, left him a modest annuity. Ray prepared his *Methodus Plantarum*, of which the first

volume was published in 1682 and the second, long after his death, in 1733. As works of science in that age as in this do not tempt a commercial publisher, Ray applied to the Royal Society for financial support in printing his great *Historia Plantarum*. This was secured; the imprimatur of Samuel Pepys, then President, being dated September 15, 1685, and the work appearing in three volumes during the years 1686 to 1704. The author's other writings, though multifarious, proved of less importance; they included a natural theology entitled: *The Wisdom of God manifested in Creation* (1691), and a *Synopsis of Quadrupeds* (1693).

The *History of Plants*, however, summarized the whole botanical knowledge of the time, and added something to it. Plants are defined as "living but not feeling bodies, fixed to a certain place or seat, bodies which can nourish themselves, grow and propagate." Adopting in general the classification of Joachim Jungius, Ray makes it more precise and, he insists, more according to nature. Perhaps he was the first to define the word "species" carefully as a group derived from similar parents and capable of reproducing its kind. Though he argued that, as God rested from work on the seventh day of creation, no new species could have since arisen, he noted that a species might degenerate and thus change to a limited degree. At times his own definitions pressed hard upon his observation of facts; as when he noted that some plants can feel; and as when he introduced an order of "anomalous plants" to include those which did not naturally fall into either of his other two great orders, herbs and trees.

Some slight advance in botanical knowledge was made by Joseph Pitton de Tournefort (1656-1708), who was born at Aix in the south of France, studied medicine, and was appointed one of the curators of the *Jardin du Roi* at Paris. In his *Institutes of Botany*³ he defined a plant as an organic body which always has roots and nearly always seeds, stalk, leaves, and flowers. He endeavored to differentiate the genera by careful comparison.

³ *Institutiones rei herbariæ*, 2 vols., 1700.

Perhaps the most important theory to be established by any botanist of the Enlightenment was that of the sexuality of plants. Though antiquity had known that the date-palm has trees of two sexes, rightly designated from the remotest period male and female, the complexity of the reproductive methods of plants, the hermaphroditism of many and the asexual reproduction of some, had long hidden from the world the truth that most plants, like animals, have sexual organs. This was first asserted and demonstrated by extensive experiment by Rodolph Jakob Camerarius (1665-1721), the scion of a famous family of humanists and scholars, and himself professor of medicine at Tübingen. His valuable observations and conclusions were not embodied in a large work, but were communicated to other scholars in private letters, of which the most important, on the sex of plants, was dated 1694. In it he rightly identified the pollen with the male and the ovary with the female element, and proved that the latter is infertile without the former.

A few curious additions to botany, as to physiology, were made by Stephen Hales (1679-1761), who, like Ray, was a student of Cambridge and a priest in the Church of England. In 1727 he published his *Vegetable Statics*, measuring the water consumption of plants, and explaining the upward flow of the sap as due to transpiration, capillarity, and root-pressure. He also showed that plants absorb air and are affected by light.

The greatest of eighteenth-century botanists was Carl Linnæus (1707-78) who, after he was ennobled in 1757, began to call himself Carl von Linné. The son of a Swedish Lutheran parson, he was educated first at the University of Lund and then at the greater University of Upsala (1728-31). Specializing in botany even thus early, he made a trip to Lapland in 1732 in order to study the flora. The years 1735 to 1738 he spent in travel in Germany, Holland, France and England. In Holland he profited by the botanical garden of George Clifford between Leyden and Haarlem, stocked with exotic plants and animals from Asia, Africa,

and America. In 1737 he visited London and Oxford, and the next year Paris, where he was elected foreign correspondent of the *Académie des Sciences*. Returning home he practiced medicine at Stockholm for three years, and then accepted the professorship of botany, metallurgy, and medicine, which he held the rest of his life. His numerous works are practically all devoted to the classification for which he had a passion and a special gift. To his own observations he added the information which came to him from extensive correspondence with scholars in all parts of Europe and in North America. Many of his pupils traveled to distant lands to collect botanical and zoölogical data; among them Pier Kalm spent three years in North America and Daniel Solander accompanied Cook in his first voyage to the Pacific.

Linnæus's best work was taxonomy—the systematization, classification, and naming of the great kingdoms, classes, orders, genera, and species found in nature. His plan grew through the various editions of the *Systema Naturæ*, first published in twelve folio pages in 1735, and constantly enlarged and improved. In this, and more clearly in his *Botanical Philosophy*, he divided the whole realm of matter into two categories, the elements, which are simple, and natural objects, which are compounded of the elements. Natural objects are again divided into three kingdoms: the stone, the vegetable, and the animal. According to Linnæus stones grow, vegetables grow and live, animals grow, live, and feel. Each of these kingdoms is divided into classes, orders, genera, and species. This classification was based on careful observation of similarity and dissimilarity, and on the old idea that each type conformed more or less closely to an archetype. His famous expression, that characters do not make the genus, but that the genus gives the characters, implies a deeper bond than that of mere resemblance. And yet, what this bond was, puzzled Linnæus and all anti-Darwinian naturalists. At times Linnæus spoke as if his "natural system" revealed the plan of the Creator; but at other times, in despair of such a plan, he confessed that

though some basis for natural classification ought to exist, none had yet been found; nor would any, in his opinion, be likely to be found.

So good was his classification for that age, however, and so convenient were his "trivial names" for the species, that both were generally adopted. He invented the binomial nomenclature by which every animal and plant was given a scientific designation in two words, of which the first is capitalized, one denoting the genus and one the species. Thus, the lion, the tiger, the leopard, and the cat, all belonging to the feline genus, are known as *Felis leo*, *Felis tigris*, *Felis pardus*, and *Felis catus*. This nomenclature, first used tentatively in the sixth edition of the *Systema Naturæ* (1748), was fully developed in the *Species Plantarum* (1753) and introduced into the tenth edition, now expanded from 12 pages to 824, of the *Systema Naturæ* (1758).

In several branches of botany besides taxonomy Linnæus did important work. He carried further the experiments of Camerarius and Sebastian Vaillant proving the sex and elucidating the reproduction of plants. His studies of the ecology and phenology of plants laid the basis for the notion of the definite connection of an organism with its environment, and made possible a zoölogical geography.

Linnæus's work, like that of many other great men, has been variously judged. Haller thought it presumptuous for him to ape Adam in naming animals afresh. Buffon had hard words for those who would force nature into the strait-jacket of a system. Nevertheless his classification, based as it was on the widest knowledge and most careful thought, gradually obtained such general acceptance as to give rise to the proverb that "God created and Linnæus arranged." Though he took many of his principles from earlier writers, he surpassed them all in breadth of vision and in delicacy of perception.

In his own age Linnæus really deserved the praise lavished upon him by Dr. Alexander Garden, of Charlestown, South Carolina, who wrote him in 1755: "Such neatness, such regularity, so clear and supremely ingenious a system

have undoubtedly never appeared in the botanical world.”⁴

One of his disciples and most ardent admirers was the Pennsylvania Quaker John Bartram (1699-1777) the founder of the first botanical garden in America. In his wide travels, from Canada to Florida, he gathered a mass of information very valuable to Linnæus, to Sir Hans Sloane, and to other European scientists to whom he imparted it by letters, and by sending specimens. Notwithstanding his limited education Bartram evinced not only a rare keenness in observation but a capacity for absorbing the best results of European research.

The zoölogy of the Enlightenment proved even more backward than the botany. No work equal to that of Malpighi, Swammerdam, Leeuwenhoek, and Redi was done. Not only were no new theories announced, but some old, and mistaken theories, like that of spontaneous generation, which had been refuted, were revived. On the other hand, a considerable amount of new knowledge, especially in the field of entomology, was arranged in more careful classification and was set forth in brilliant narrative.

Ray's *Methodical Synopsis of Quadrupeds and Serpents* (1693) exploded the prevalent notions of fabulous monsters, denied the possibility of spontaneous generation, and defined an animal as “a living body endowed with the faculties of feeling and of locomotion.” He followed Aristotle's classification into the blooded and bloodless animals (roughly corresponding to vertebrates and invertebrates), and the former into lung-breathing and gill-breathing orders. Lung-breathing animals are again divided into those with hearts of one ventricle and those with hearts of two ventricles. The latter are again divided into viviparous (mammals) and oviparous (birds); and the animals with hearts of one ventricle into reptiles and serpents. The bloodless animals were arranged as small (insects) and large (mollusks, crustacea, shell-fish). As in his botanical survey, so in his zoölogical he classed some forms—the hedgehog, mole, shrew-mouse, armadillo, sloth, and bat—as “anomalous.”

⁴ *Correspondence of Linnæus*, 1821, i, 284.

The Linnæan classification and terminology imposed itself generally on the fauna as it had on the flora of the world. According to this, six classes of animals were recognized: mammals, birds, amphibia, fish, insects, and worms.

That Buffon rebelled against this system may be attributed both to his perception that it is artificial and logically unsatisfactory and to his equally keen sense of its unfitness for effective literary presentation. In an introductory discourse on the method of *Studying natural history*,⁵ after eloquently setting forth the vastness and grandeur of the spectacle of the world, he argued that nature cannot be subjected to particular methods, nor reduced to little systems which are foreign to her. That the mold of system is not in nature but in the mind of the student is proved, Buffon continued, by the multiplicity of systems. The search for system he compared to the search for the philosopher's stone; the object sought does not exist and can therefore never be found, but the search for it has uncovered many useful facts. Such illusions, he philosophically concludes, are perhaps necessary to stimulate man's best efforts.

If Buffon's reasons for rejecting the system of nature proposed by Linnæus are philosophical, the order which he himself adopted has nothing to recommend it to the scientist. His sole base of classification is convenience; he arranged species as he arranged books in a library, where those most used are put in the most accessible places. He justified this method by arguing that it is pedagogically natural, that it treats the animals in the order of their interest to man. Thus, he begins with the domestic animals, proceeds to the more familiar wild ones, and then to the strange and unobtrusive.

Beginning with a definition of "animal" and "species," he continued with an anatomical description of the general structure of animals, and with a physiology of their nutrition and reproduction. Notwithstanding the great emphasis he laid on the processes of generation, and the amount of

⁵ *Œuvres*, i, 1 ff.

study given to it, the author here appears at his worst. Not only is he still uncertain whether, in ordinary generation, the female contributes anything to the heredity of the offspring, but he essays to revive the theory of spontaneous generation, already thoroughly discredited by Redi and others. Speculation on the origin of life on the globe led him to adopt the theory that germs of living beings are widely distributed in inorganic matter and will develop into living beings under proper conditions. Had he stopped here, he would have been unassailable: his proposition, though unprovable, cannot be disproved and either it, or some similar hypothesis, is apparently necessary to account for the presence of life on the globe. But Buffon did not stop here; he argued *a priori* that what had once taken place would naturally continue to take place; and he asserted *a posteriori* that he had actually proved that it did take place by experiment. His apology⁶ is found in a letter written in 1750:

It may seem strange to you, after all the discoveries of our dissectors of insects, after all the efforts of our modern naturalists to banish for ever this axiom of philosophy: "the corruption of one thing is the generation of another," that I should try to reëstablish it. Nevertheless, it is not a theory, but an accomplished fact which I can prove, not only by the observations that I have reported but by many others that I have reserved for the history of the animals of microscopic size.

After a general introduction the *Natural History* describes in order the horse, the ass, cattle and other domestic animals, then deer and other game animals, then the other beasts of the Old and of the New World. Mammals and birds are the only orders treated. Carefully drawn and handsomely colored plates add to the clarity and beauty of the work.

Less extensive and philosophical, but more accurate and original than the work of Buffon, Réaumur's entomology perhaps marks the height of eighteen-century natural history. After grounding himself in physics, and while perfecting the thermometer, Réaumur devoted his leisure to the

⁶ *Correspondance de Buffon*, i, 42.

investigation of small animals. In 1712 he made known the singular phenomenon of the new growth of amputated limbs of lobsters; in 1715 he correctly described, though he could not explain, the electric shock given by the torpedo fish; in 1723 he investigated the light emitted by certain molluscs. His great work was the *Mémoires pour servir à l'histoire des insectes*, of which six volumes appeared during the years 1734-42, and of which four volumes were left in manuscript. After protesting that the science of entomology has not progressed far enough to present a complete history of insects, the author apologizes for his work, which some might regard as useless, by alleging that it may prove amusing and may furnish another proof of the existence of God. To the modern reader no such justification is needed for the marvelous descriptions of the life and structure of the various genera of insects. The author tells us that what interested him most is

that which relates to the character and manners, so to speak, and to the livelihood of so many little animals. I have observed [he continues] their different manners of life, how they get their nourishment, the ruses which some of them use to seize their prey, the precautions which others take to keep themselves safe from enemies . . . the choice of places where to lay their eggs so that the young, hatching out, will find suitable food from the moment of their birth.⁷

With consummate patience, delicacy, and insight, Réaumur spied out the life of the little creatures. His scientific spirit led him to protest against attributing moral qualities to insects, as many authors had attributed chastity to bees, industry to ants, and even charity to some creatures. Better than anyone had done before he fathomed what may be called the insect mind, the instinct so different from our intelligence and yet so perfect in its way.

Among other notable entomologists of this period one was Maria Sibilla Merian (1647-1717), the daughter of a famous engraver, Matthew Merian, and the wife of the painter J. A.

⁷ Réaumur: *Mémoires pour servir*, i, 13.

Graff, of Nuremberg. During the years 1699 to 1701 she traveled to Surinam and while there studied carefully and depicted brilliantly a vast number of insects. These studies and these colored plates were published under the title *Dissertatio de generatione insectorum Surinamensium* (1705). Much earlier she had described *The Wonderful Metamorphosis of Caterpillars* (*Der Raupen wunderbare Verwandlung*, 1679-83), for the first time surveying the species of a large group with their larvæ.

Equally notable are the anatomical studies of Pierre Lyonet (1707-89), whose treatise on the willow-moth laid the foundations of insect anatomy.

While observers were busy describing and systematizers classifying, speculators opposed the idea of evolution, which, nevertheless, forcibly suggested itself to many minds when they were, so to speak, off their guard. All that was best, and all that was most deficient, in the thought of the age, consciously rejected the hypothesis of development applied to the origin of species. Science rejected it as one of the ancient, philosophical theories, worked out *a priori* in disregard of the purely experimental and quantitative method of the new empiricism. Superstition anathematized it as repugnant to revelation. Hence it was occasionally considered only to be rejected, or to maintain a precarious existence in the works of men not primarily scientists. A genetic conception of nature doubtless hovered in the background of the thought of Leibniz and of Locke and was cherished by Maupertuis and Diderot. The origin of one species from another was decisively rejected by Linnæus in 1735, in these words:

It is abundantly and more than abundantly evident that all living things are propagated from the egg, and that every egg produces progeny similar to the parent. Hence no new species are nowadays produced.⁸

At times, however, he had his misgivings. His experiments in crossing different species of geraniums almost persuaded him that

⁸ *Systema Naturæ*, 1735 (facsimile ed.), 1.

the different species of one genus of plants are produced by different crossings; and hence that a genus is nothing else than a number of plants sprung from the same mother by different fathers. But whether these species are the offspring of time, or whether, in the beginning, the Creator limited the number of future species, I dare not presume to determine.

Assuming that the creation of new species by hybridizing is possible, he even went so far, in one place, as to suggest that it would be a good employment for botanists to produce new useful plants.

Though Buffon finally rejected the evolutionary view, he suggested it in the following striking passage:

If we regard the matter thus, not only the ass and horse but even man himself, the apes, the quadrupeds, and all animals might be regarded as forming the members of one and the same family. . . . If the point were once gained that among animals and vegetables there had been, I do not say several species, but even a single one, which had been produced in the course of direct descent from another species . . . then no further limit could be set to the power of nature, and we should not be wrong in supposing that with sufficient time she could have evolved all other organic forms from one primordial type.

The genetic theory, in an imperfect form, was championed by an excellent naturalist and philosopher, Charles Bonnet (1720-93). Born at Geneva, he obtained office in his native town, but devoted himself to entomology until a disease of the eyes forced him to abandon observation for speculation. As a disciple of Réaumur, he published, in 1745, a treatise on insectology (as he called it) which admirably follows in the footsteps of the master. Among other things he discovered the parthenogenesis of aphides, or plant-lice, the budding reproductive method of the cœlentera, the metamorphosis of certain insects, and tropisms in various plants. His theory of reproduction was the "incapsulation," of "box within box" theory; that is, that the female contains the germs of her children, these germs contain the germs of their offspring, and these the germs of theirs *ad infinitum*. These

germs, he thought, could be found not only in the ovary but in various parts of the body, as proved by the regeneration of the amputated limb of a crustacea. This theory suggested to Maupertuis (1751) one which closely resembles Darwin's pangenesis: that the elementary particles from which the embryo is formed are drawn from the corresponding part of the parent.

Bonnet advanced the idea of progressive development in nature, which he thought could be seen ascending towards a lofty goal. Changes in living forms he accounted for by changes in the climate and geography of the earth. Each great epoch, he deduced from fossil remains, is cut short by a natural catastrophe which spares the germs for a new start in the next epoch. Finally, Bonnet crowned his evolutionary thought by drawing up a ladder of natural things,⁹ of which some of the rungs, beginning at the bottom, are as follows: subtle matter, fire, air, water, earth, metals, salts, stones, mushrooms, lichens, plants, insects, worms, shellfish, snails, snakes, eels, fish, flying fish, birds of the air, ostriches, bats, squirrels, quadrupeds, monkeys, orang-outangs.

The most important innovation made by the cultivators of the natural sciences during the eighteenth century was the separation from the general body of zoölogy of that part of it treating man as an animal. Thus were founded the sciences of anthropology and ethnology by which the realm of science was extended more broadly and by which bright side-lights were shed upon the older social sciences. The exploration of the globe as exhibited in the narratives of travelers, both those of the eighteenth and those of earlier centuries, brought in an immense material for the comparative study of man. How these were distorted, idealized, and romanticized to meet the needs of political and philosophic propaganda will be set forth in subsequent chapters. Though some of the explorers were guilty of distorting the truth in the interests of piquancy or of prejudice, most of them gave a fund of information equally remarkable for its

⁹ Bonnet: *Œuvres*, i, xxxiii.

copiousness, its veracity, and its objectivity. Such magazines of fact were some of the descriptions of China then published; such were the voyages of Captain Cook in their original form; such were most of the narratives of the Jesuit Fathers in the American Mission.

The first attempt to work up this new material into a comparative and historical ethnology was a book by J. F. Lafitau entitled *Manners of the American Savages compared to the Manners of Primitive Times* (1724). With really brilliant insight the author compares the Indians to the people of the age of Homer and of Moses. Though ridiculed at the time by philosophers unwilling to admit that the inspired heroes and sages of antiquity were savages, and though open to just censure in carrying the comparison to absurd lengths—as when the caduceus is found in the peace-pipe and manna in the sugar-cane—nevertheless the work deserves the praise of having been the first to point out the real parallel between ancient and contemporary barbarism.

A more comprehensive and equally brilliant attempt to found an anthropology worthy of the name of science was made by Buffon. The first truth that emerged from his examination of nature was that man must place himself among the class of animals whom he so much resembles on the material side; though he puts himself at the head of created things, man learns, perhaps with astonishment, that the scale of nature descends by imperceptible gradations from the most perfect creature to the most formless matter.¹⁰ Admitting the existence of the soul in man alone, Buffon laid bare the animal nature of man in a careful description of the human body,¹¹ of the mechanism of the senses, and of the physical basis of love. Compiling data on the habits of wild tribes and on abnormal phenomena in civilized peoples, Buffon laid the foundations of human geography and of ethnography. Regarding humanity as fundamentally the same in all parts of the earth, he skillfully depicted the modification of the original stock under the influence of

¹⁰ *Œuvres*, i, 11.

¹¹ *Histoire de l'Homme*; *Œuvres*, vols. xiii-xv.

climate, soil, habits, and prejudices. Not the least of his titles to greatness is his insight into the natural forces which have changed the color and features of different races, that have given birth to diversity of tastes, opinions, and manners, and that have largely accounted for the decadence of some races and for the advancement of others. Buffon's only rival in his own age in treating man as to some extent an evolutionary product was Dr. John Mitchell, of Virginia, who, in a treatise published at Nuremberg in 1748, discussed the coloration of races from this standpoint.

3. PHYSIOLOGY AND MEDICINE

When Vesalius, Malpighi, and Swammerdam were breaking down the authority and prestige of the classic anatomists and medical writers, they did not feel called upon to frame a general theory of life corresponding to the new facts observed by them. But the need for a comprehensive and consistent system was so great that the vacancy created by the deposition of the earlier theorists was promptly filled by a new system created, or given its accepted form, by Descartes. This system was mechanism: the reference of all bodily actions in man and animals to the push and pull of material forces. The triumphs of Newton lent support to the view that all nature lies subject to mechanical laws. Against this view, however, there was the earnest protest of the vitalists, who found in the phenomena of life as studied by them, as well as in religion and philosophy, reason to believe that the actions of living creatures transcend the laws of physics. The debate between mechanists and vitalists, then at its hottest, still warms our laboratories and studies.¹²

The most thorough-going exponent of the mechanistic

¹² See various works by Joseph Needham on the mechanist side, and by J. B. S. Haldane on the vitalist side of the debate. A brilliant attempt to reconcile the antithetical views in the synthesis of "integration," may be found in an article by Professor R. M. Ogden: "Crossing the Rubicon between Mechanism and Life," in the *Journal of Philosophy*, xxii, 281, 1925.

theory, between Descartes and La Mettrie, was Friedrich Hoffmann (1660-1742), a professor of medicine at Halle, who had been educated at Jena and Erfurt and who had learned to know Boyle on a journey to England. Regarding the body as a machine kept going by the circulation of the blood, he explained life as a physical process from which the operations of the soul might be excluded. Either sincerely, or prudently, he admitted the existence of a soul, but denied it participation in the corporal motions.

Relying rather on psychological observations than on microscopic anatomy, which he scorned, Stahl the chemist took the field in favor of the teleological, or vitalistic theory. Contrasting the processes of a living body with those of an inanimate engine, he set forth the view that the soul is the most essential part of the living creature, that which gives life and which prevents decomposition. Admitting the existence of chemical attributes in the body, he urged the argument that the body can be seen to possess, in addition to these, a special texture and structure different from that of inorganic matter. The direct influence of the soul on the body he proved by the telling observation that certain mental states produce corporal reactions, as when the sight of food makes the mouth water. He even concluded that all disease is due to mental states, "an error of mortal mind," as it were; and this theory was adopted, with bad results, at the medical school at Montpellier.

The celebrated Dutch physician Hermann Boerhaave (1668-1738), under the influence of Spinoza, essayed to reconcile the two opposite schools by postulating a thorough dualism in which all that involves thought is referred to the soul and all that involves motion or extension is referred to a machine-like body. It may have been a contribution to the subject to show, as he did, that it is possible to hold to mechanical laws in explaining the actions of the muscles and the perceptions of the senses, and to discard them as sufficient explanations of the processes of thought.

At this point the great religious leader Swedenborg (1688-1772) intervened with a theory intended to reconcile the

mechanistic view with the claims of piety. His study of Malpighi, and still more his own careful necropsies and dissections of the brain, convinced him of the truth of the mechanistic theory. Better than anyone had yet done, he localized the functions of the mind in the cortex of the large brain, assigning to the different parts of the cortex the several functions by which they are connected with the parts of the body. On this substructure for the soul, he built a metaphysical theory, partly sound and partly fantastic, of the relations of mental operations to material stimuli.

As the scientific writings of Swedenborg, published in the forties, attracted little attention for a century and a half, the debate might have been carried on in the laboratories of scientists had it not been transferred to the arena of public opinion by the popularity of a striking book published in French in 1748 and translated into English in the following year. This was *L'Homme Machine* by Julien Offroy de la Mettrie (1709-51) who was born in Brittany and bred for the priesthood, but changed his mind on passing by way of Jansenism to skepticism, and became a physician instead. After taking the doctorate at Reims, he pursued further studies first at Paris and then with Boerhaave at Leyden. His unorthodox views, both in medicine and in religion, exhibited to the world in his early work, *The Natural History of the Soul*, forced his withdrawal first from Paris and then, after the publication of the still more heretical *Man a Machine*, from the Netherlands. Fortunately for him there reigned in one country a philosophizing who assured a warm welcome to persecuted men of science. In Berlin, then, he spent his last three years until, in 1751, an untimely death caused by eating mushrooms brought to an end a brilliant career, though not before the author had published various other works on philosophy, science, ethics and religion, including an anonymous refutation of *Man a Machine*, entitled *Man more than a Machine*, intended still further to arouse public interest in that work. Not less than his daring opinions, his brilliant style, formed by the best modern models and able to quote aptly from

Alexander Pope and other contemporary poets, contributed to the wide propagation of his views.

His philosophical materialism and ethical hedonism were founded on a comparative study of physiology. Convinced that man differs in no essential particular from other animals, that he may equally well be regarded as an animal, as a plant, or as a machine, the author sets forth cogent reasons drawn from biology to support this thesis. As an earlier behaviorist he argues that observation is the only guide to psychology. He shows how the mind is affected by physical conditions, as by fever, by drugs, by a blow on the head, by sleep, and even by food. He then proves by a study of reflex actions and by an observation of a turkey that ran around and flapped its wings for some time after its head was cut off, that the body is capable of functioning without the mind. Finally, he argues that the transition from man to animals, and from animals to plants, is gradual. With extraordinary insight he attributes the superiority of the human mind over that of the other animals to man's capacity for symbolic reasoning. Had not man invented words, numbers, and such convenient symbols of ideas, he would have been in no wise different from any other brute. Starting from the level of the apes, he has been polished and civilized by language, law, science, and art. Could the orang-outang be taught by the newly invented deaf-and-dumb alphabet, he would soon, La Mettrie assures his readers, develop all the human characteristics.

Among the great mechanists must be reckoned Denis Diderot, whose contributions to science, though not his chief titles to fame, are by no means contemptible. He discovered that there is no distinct line dividing animals from plants, and inferred that there is none separating organic and inorganic matter. Believing, as Buffon taught, in spontaneous generation, he considered sensation a general property of matter, and found the transition from sensation to thought easy. Learning from La Mettrie, and from his own investigations, that pain, pleasure, the passions, wine, narcotics, catalepsy, heat, and cold affect the mind equally with

the body, he inferred that "the mind is nothing without the body." "Organs produce needs," he added, "and reciprocally needs produce organs." His mechanical conception of life justified and was justified by, his general materialistic philosophy.

La Mettrie dedicated *L'Homme Machine* to a man equally celebrated as a scientist, a philosopher, and a poet, Albrecht von Haller (1708-77), the scion of a Bernese family already noted for having, at an earlier age, produced statesmen and reformers. The two influences that moulded his earliest years were a love for the sublime scenery of his native country and a strict Protestant and Puritanical family life. Educated at Basle, Tübingen, and Leyden, he soon evinced such an absorbing, not to say inhuman, passion for science that he spent his wedding night solving a differential equation. After visiting London and Paris, he lived seventeen years (1736-53) as professor of anatomy at Göttingen, after which he returned to public life in his own city. Among the various positions that he filled, one, director of the public salt works, gave him opportunity for mineralogical, geological, and botanical research. An extensive correspondence brought him into contact with the leaders of opinion in all European countries. His poems foreshadowed the romantic school. Though his strict Protestant religion gradually gave way to broader views and to warmer sympathies, he maintained his hostility to the extreme rationalism of the age represented by Voltaire. Among his 650 books and articles those on physiology alone concern us at this point.

Defining physiology as "the exposition of the motions by which the living machine is agitated," he worked from the fruitful thought that the morphological structure is the primary foundation of the various processes and functions of life and of thought. He first nicely differentiated the insensitive, the sensitive, and the irritable organs: thus, the bones, cerebrum, spleen and kidneys are insensitive; the intestines and muscles are sensitive; the diaphragm, veins, and sexual organs are irritable, that is, react automatically to a stimulus. He showed further that the nerves alone are

the organs of feeling, that they are all gathered into the *medulla cerebri*, and that therefore sensation and thought must take place here. The nerves he believed to be hollow tubes carrying a nervous fluid described as "an element of its own kind" and capable of transmitting sensation.

Valuable researches were made by some other writers not partisans in the mechanistic debate. Frederik Ruysch (1638-1731) a professor at Leyden, invented the useful art of injecting colored substances into the veins and made vast anatomical collections of which one was sold to Czar Peter of Russia in 1716 for 30,000 guilders and a second found its way, after Ruysch's death, to the university of Wittenberg.

Very remarkable was the discovery of reflex action by Robert Whytt (1714-66), a neurologist of Edinburgh, who thus described it in an *Essay on Vital and other involuntary Motions of Animals* (1751):

The motions excited by any pain or irritation are so instantaneous that there can be no time for the exercise of reason or a comparison of ideas in order to their performance, but they seem to follow as a necessary and immediate consequence of the disagreeable perception. . . . Our minds are so formed and connected with our bodies that, in consequence of a stimulus affecting any organ, or of an uneasy perception in it, they shall immediately excite such motions in this or that organ, or part of the body, as may be most proper to remove the irritating cause.

Some good work was done by Stephen Hales who followed his *Vegetable Statics* with a book on *Hæmastatics* in 1708. By insetting a tube into the artery of a mare's leg, he found that the blood was pumped to a height of 8 feet and 3 inches above the heart. His deduction, that the action of the heart would overcome a resistance of 51.5 pounds, is very nearly correct.

To the theory of reproduction something was contributed by Buffon. Starting with a study of the reproduction of primitive animals, he tried to get rid of the incapsulation theory, for which he would substitute an epigenetic theory

of his own. According to his hypothesis every animal has an "interior mold" by which it stamps its own form on its progeny, much as a bullet-mold gives its own form to the lead poured into it.

A much greater advance was made by Caspar Friedrich Wolff (1733-94) a Berliner who taught medicine at his native city and philosophy at Halle and whose *Theory of Generation*, published in 1759, was neglected in its own day to be revived and acclaimed in ours. Studying the anabolism which causes growth and re-creates organs, he saw that reproduction, or the separation of a new individual from a parent, is but a contrivance for freshening languishing growth; that is, when the parent reaches maturity, growth stops and then weakens, and the whole metabolic process would come to an end but for the ability of the organism to start a new being on a life-cycle of its own.

Though the advance of anatomy and physiology redounded to the benefit of medicine, many factors, intellectual, social, and economic, retarded its progress. Leibniz correctly diagnosed one of the social diseases when he said that medicine failed to improve because it was regarded not as a science to be studied but as a trade to be plied for profit.¹³ Another obstacle in the path of progress was the popular aversion to dissection of human bodies that still persisted in certain quarters. Though a few medical schools had been dissecting the bodies of criminals ever since the fourteenth century, the increased demand for cadavers, owing to the spread of science, had outrun the supply and had thus given rise to the odious profession of "body-snatching," or digging up newly buried bodies for sale to laboratories. The excitement over this ran high in Great Britain and in America. In 1725 a riot in Edinburgh forced Dr. Alexander Munro to remove his anatomical preparations; and in 1762 a mob broke up Dr. William Shippen's classes in the medical school at Philadelphia.

The social status of the physician improved during the eighteenth century. The large fortunes made by some doc-

¹³ Huygens: *Œuvres*, x, 639; letter of Leibniz, 1694.

tors, the conferring of a baronetcy on Sir Hans Sloane, the fashionable dress of doctors, and the admission of medical men to the best society, all testify to the prestige of the profession. The novelists, indeed, continued to poke fun at the doctor as they did at the lawyer, the clergyman, and the professor. Smollett's Count Fathom and Sterne's Dr. Slop caricature the ignorance, conceit, and absurdities of charlatans. Le Sage, in *Gil Blas*, exhibits Dr. Andros and Dr. Oquetos allowing their patient, Don Vincente, to die while they dispute as to whether his "orgasm of the humors" as defined by Hippocrates, was a concoction of the said humors, or a fermentation of them. Elsewhere Le Sage shows Dr. Sagrado bringing a patient to death's door by drawing eighteen bowls of blood from his veins.

Apart from the deficiencies of reputable practitioners there was an enormous amount of quackery abroad. It almost seems as if the current of superstition, turned aside from its older channels of belief in witchcraft and some other forms of magic, debouched its noxious flood in the fair field of medicine. Dr. R. Mead wrote on *The Power of the Sun and Moon over Human Bodies* (1704), while Hoffmann tried to connect the phenomena of life and of disease with the state of the ether of space. An enormous number of proprietary medicines were patented and exploited; all guaranteed to cure everything, and the best of them merely harmless. Animal magnetism was invented, and electricity was abused in quack cures, or in the creation of "celestial beds" advertised to rejuvenate senility. It is remarkable that these frauds were most lucrative and popular in the lands of old civilizations. America luckily escaped them together with some other refinements of over-ripe culture.

Quite apart from fraudulent practice upon credulity there was, however, enough of ignorance and prejudice in the best theory of the age. Diderot's *Encyclopédie* quite rightly asserted that modern medicine had given birth to monstrous and ridiculous systems only to reject them. Some historians have given credit to eighteenth-century writers for more advanced theories than they really held. Daniel Defoe's

words in his *Journal of the Plague Year* (1722, later called *A History of the Great Plague in London*) have sometimes been quoted as an anticipation of the germ-theory of infection; but can they really be so interpreted? He says that some people believe that the plague might be distinguished by the patient's breathing on glass,

where, the breath condensing, there might living creatures be seen by the microscope, of strange, monstrous, and frightful shapes, such as dragons, snakes, serpents, and devils horrible to behold; but this I very much question the truth of, and we had no microscopes at the time to make the experiment with.

The greatest advance was made in surgery, dependent as that is directly upon anatomy. The long standing feud of the physicians and surgeons was composed, and the stigma on surgery as an inferior branch of the profession was removed, when François de Lapeyronie (1678-1747), surgeon in chief of the Montpellier hospital, was called to Paris in 1714 and when a Royal Academy of Surgery was founded at Paris in 1731. Only in Paris, however, was proper instruction given in surgery until the Hunters began to give it in London towards the end of the period of the Enlightenment.

Apart from surgery the best medical education was to be had at Leyden, where alone clinical instruction was given. Not infrequently the practitioner obtained his education by the method of apprenticeship to an older physician. It is remarkable that this method produced, especially in the American colonies where it was alone available, some of the ablest physicians of the time. Professional education was fostered by the founding of several new medical societies (one in Boston in 1735), and by the publication, in addition to the older scientific periodicals, of medical journals, of which the first was the *Weekelijk Discours over de Pest*, started at Amsterdam in 1721.

Though the conditions in hospitals continued to be bad, owing to the herding together of patients with different infectious diseases and owing to the septic fevers there endemic, something was done to improve the pest houses,

especially those founded in Massachusetts in 1764. Quarantine laws were general and sometimes effective.

The greatest advance in preventive medicine during the period of the Enlightenment was the introduction into Western Europe and America from Turkey of the practice of inoculation with smallpox, then a pandemic and fearfully mortal disease. It is generally said to have been brought to England by Lady Mary Wortley Montagu; this is not true, but as her letters from the East did something to popularize it, and as one of them gives a good account of the method then used, so different from our mild vaccination, it is worth quoting. The author, a daughter of Evelyn Pierrepont, afterwards Marquess of Devonshire and Duke of Kingston, in early youth made a reputation for beauty, wit, and daring, and numbered among her correspondents, admirers, and enemies, many of the leaders of fashion and of literature in England. In 1712 she married Edward Wortley Montagu, and four years later, on his appointment as ambassador to Turkey, accompanied him to the Orient. Her lively and romantic letters from the East, though not published until 1763, were circulated in manuscript and did much to foster the prevalent exotic taste. In one of them, to Mrs. Sarah Chiswell, dated Adrianople, April 1, 1717, she gave the following interesting account of the process of inoculation as practised in Turkey: ¹⁴

À propos of distempers, I am going to tell you a thing that will make you wish yourself here. The smallpox, so fatal and so general amongst us, is here entirely harmless, by the invention of *ingrafting*, which is the term they give it. There is a set of old women who make it their business to perform the operation every autumn, in the month of September, when the great heat is abated. People send to one another to know if any of their family has a mind to have the smallpox; they make parties for this purpose, and when they are met (commonly fifteen or sixteen together), the old woman comes with a nut-shell full of the matter of the best sort of smallpox, and asks what vein you please

¹⁴ *Letters of Lady Mary Wortley Montagu*, ed. W. M. Thomas, 2 vols., 1887, i, 184 f.

to have opened. She immediately rips open that you offer her with a large needle (which gives you no more pain than a common scratch) and puts into the vein as much matter as can lie upon the head of her needle, and after that binds up the little wound with a hollow bit of shell; and in this manner opens four or five veins. . . . The children or young patients play together all the rest of the day, and are in perfect health to the eighth. Then the fever begins to seize them, and they keep their beds two days, very seldom three. They have very rarely above twenty or thirty [spots] in their faces, which never mark. . . . I am patriot enough to take pains to bring this useful invention into fashion in England.

Though this letter, and the example of the writer, who had her own child inoculated in 1718, did something to make the practice general in England, it did not prove the first or decisive factor in the innovation. Records of inoculation in the Orient have been traced back to the latter half of the seventeenth century. In 1714 Timonius, a Greek physician of Constantinople, who had been educated at Oxford, published an account of the method which he sent to the Royal Society. Another dissertation, by one Pylarinius, first published in Venice in 1716, was noticed in Volume XXIX of the *Philosophical Transactions*; and other matter on inoculation appeared in the same scientific journal.

The actual adoption of the practice in the Western world was due to the exertions of the Boston clergymen, Cotton Mather, and his son Increase. With that intense interest in science characteristic of the early New Englanders, and with that practical bent already typical of Americans, these gentlemen read of inoculation in the *Philosophical Transactions* and, when an epidemic of smallpox broke out in Massachusetts in 1721, induced the leading local physician, Zabdiel Boylston, to apply it. Boylston (1679-1766), a grandson of one of the first settlers, was educated in medicine by his father Thomas, the leading Boston medical man of his generation. On June 6, 1721, Cotton Mather addressed a letter to the physicians of Boston, urging them to inoculate. When some of the pious objected to this interference with

God's providence, and proposed treating any physician whose patients should die of inoculation, as a homicide, Increase Mather came to the help of the cause in a tract entitled: *Several Reasons proving that inoculating or transplanting the Small Pox is a lawful practice and that it has been blessed by God*. For a time the selectmen of Boston forbade the practice, which had already been started by Boylston, but when it was shown, in October 1721, that of more than sixty persons inoculated only one had died, they repealed the prohibition, and the work went forward briskly. Of the 280 persons known to have been inoculated during this epidemic, of whom 240 by Boylston himself, only six died; whereas the death-rate among those who caught the disease naturally, mounted to twelve or fifteen per cent.

When the satisfactory results of the experiment became known in England, Boylston was invited to lecture there before the Royal College of Physicians and the Royal Society, to which he was elected a member. His *Historical Account of the Smallpox inoculated in New England*, printed in London 1726 and reprinted in Boston 1730, attracted wide attention and really started the practice in Europe and in the other American colonies. In all quarters it met with some opposition from conservative theologians, who denounced it as tempting Providence and as imitating the devil who caused boils to break out on the body of Job. Benjamin Franklin answered them in *Poor Richard's Almanack*, in which, in 1737, he published the following verses:

God offered to the Jews salvation,
And 't was refused by half the nation;
Thus (though 't is life's preservation)
Many oppose inoculation.

By the middle of the century the practice had become general in Western Europe and in North America. Hospitals were erected for it—one of the first in London in 1746. In 1754 the Royal College of Physicians pronounced in its favor. Though the results were doubtless beneficial, they were much less so than the results of vaccination which

first, at the end of the eighteenth century, greatly reduced the mortality from smallpox. Daniel Bernoulli calculated, on the best available information, that the average longevity of a European was increased by three years since the general adoption of inoculation. D'Alembert, however, pointed out a fallacy in the reasoning of those who overestimated the benefits of the practice by alleging that smallpox kills one person in seven of those who catch it naturally; whereas inoculation kills only one person in 300. These risks, he justly remarks, are very different. An inoculated person runs one risk in three hundred of dying within two weeks; a person not inoculated takes one chance in seven of dying of smallpox in the next fifty or sixty years, and there are many who would prefer the latter risk to the former. He did not, however, deny that inoculation may reduce the death-rate.¹⁵

Among the lesser medical innovations of the time may be mentioned the following: Bernardino Ramazzini (1633-1714) in his *Treatise on the Diseases of Workmen* (1700) opened up the field of occupational maladies and industrial hygiene. Stahl's *True Medical Theory* founded the school of "expectative" medicine, asserting that nature alone could cure and that art could do no more than furnish favorable conditions. Giovanni Battista Morgagni (1682-1771), educated in medicine at Bologna and professor of it at Padua, wrote a fine work on the *Seats and Causes of Disease*. Carefully reporting the results of 700 necropsies performed by himself and his friends, he covered the whole span of pathological anatomy, pointing out the importance of accurate correlation of the symptoms of disease and of post-mortem dissections to discover the inward causes of death.

One of the most interesting men of the time, though owing his chief fame to his hobby, Biblical criticism, also built up a subsidiary reputation in his profession. Jean Astruc (1684-1766) was born in Languedoc as the son of a Huguenot pastor who, soon after his son's birth, became a Catholic. Graduating in medicine at Montpellier and teach-

¹⁵ D'Alembert: *Opuscules*, ii, no. 11.

ing it at Paris, Astruc published some important medical studies and left others in manuscript. As these latter are not infrequently met with in the catalogues of second-hand book dealers, I infer that they were rather widely copied and used. One of these unpublished manuscripts, a *Treatise on the diseases of the Aged* (*Traité des maladies des vieillards*), I bought in 1927 for Cornell University. Beautifully written in legible script by the author's pupil, N. Coillot, it describes gout, rheumatism, trembling of the limbs and other afflictions of old age. While I can testify to the care with which symptoms are described and remedies prescribed, I cannot gauge the scientific value of the work. Better known, because published in 1736, is the *Treatise on Venereal Diseases*, important now rather as an evidence of contemporary error than of the discovery of new truth. Strange as it may seem, the physicians, after two centuries of observation, still failed, in the eighteenth century, to distinguish syphilis from gonorrhœa. The author, who read very widely and who quoted from Oviedo and Erasmus (though without mentioning the name of the latter, whose works were on the Index) asserted that the venereal disease came from America. This is in doubt. Some scholars now believe that syphilis was epidemic in Europe in the later middle ages, and that the mercury cure was applied to it as early as the fourteenth century at least.

Important advances were made in surgery by Jacques Daviel (1696-1762) who in 1752 originated the modern treatment of cataract by extraction of the lens, and by John Hunter (1728-93) who proposed new methods of treating shock, gunshot wounds, and inflammation. He also, it is interesting to add, confused gonorrhœa and syphilis. His elder brother, William Hunter (1718-83) improved obstetrics and built an anatomical theater in 1768, in Great Windmill St., London, to give instruction in it. This date may conveniently be taken as marking the definite passing of the treatment of parturient women by midwives to their treatment by trained male physicians, though of course the practice did not change suddenly. Dental surgery was

greatly advanced by Fauchard's *Le Chirurgien Dentiste, ou Traité des Dents*, published in 1728. The examination of diseases of the chest by the method of percussion was invented by Leopold Auenbrugger in 1761.

Until the eighteenth century and later most zymotic and some other diseases were confounded. The word "pox" itself, still applied to syphilis, smallpox and chicken-pox, is a monument of this confusion. Nor was scarlet fever differentiated from other fevers until William Douglass (1691-1752) a Scotchman by birth and American by adoption, observed the epidemic at Boston and described it in a book entitled *The Practical History of a New Epidemical Eruptive Military Fever . . . in the Years 1735 and 1736*. His extraordinarily accurate observation and description of the disease for the first time definitely distinguished it. Ten years later the English physician, John Fothergill, published the "classical" description which has often, though mistakenly, been described as the first.

The Virginian physician, John Mitchell, investigated the causes of the yellow fever epidemic. It is now claimed that Virginian surgeons were the first to perform the Cæsarian section on living women, the first to operate for club-foot, and the first to publish a pharmacopœia. Virginia is also said to have passed the first general law governing medical practice.

CHAPTER IV

THE PLACE OF SCIENCE IN EIGHTEENTH-CENTURY THOUGHT

I. SCIENTIFIC METHOD

As the history of modern culture is largely an account of the advancement of science, of the effects of scientific discovery, and of the diffusion of the scientific spirit, it is highly important to observe the steps in this advance, and to analyze the vast, complicated, and yet unified process into its component parts. The primary, original, and causative factor is, of course, the progress of pure knowledge, either by the accumulation of new facts, or by classification, interrelation, and colligation of the known facts into those convenient formulæ and generalizations called natural or mathematical laws. The progress of knowledge, however, releases and impels two great secondary processes, one material and the other intellectual. As knowledge is power, every increment of pure science is followed, sooner or later, by some technological invention or improvement which, by increasing man's power over nature, changes the material environment and so modifies the conditions of social evolution. On the other hand, the advance of science alters the world-view of those cognizant of it, and modifies their thought in many other than purely scientific fields. This process of the diffusion of the new ideology may again be analyzed into two sorts of forces, or pushes, one vertical and one horizontal. By the vertical push, I mean the conquest by the scientific spirit of the other fields of intellectual and spiritual life. From physics and mathematics the experimental and geometrical method is extended, first to the fields covered by the other natural sciences, then to the

provinces of social investigation, such as history and politics, then to philosophy, religion, and education, until at last there is no department of human thought, from metaphysics at the top to magic at the bottom, that has not been colored and illuminated by the new light. By the horizontal spread of the same spirit, I mean its diffusion into ever wider social circles, until what had once been the arcanum of a tiny group or even of a single thinker, becomes the commonplace of the man in the street and of the child in the school.

As the seventeenth century was the seminal era of great discoveries, as the nineteenth century saw the total transformation of man's material environment, so the eighteenth century was distinguished less by either of these processes than by the resolute and successful effort to transfer the scientific spirit to other intellectual fields and to propagate it among ever larger strata of the population. Of course all three processes work together; none of them has been, in modern times, even sluggish, much less stagnant. But in general it may be said that the Enlightenment, while adding less of fundamental importance to the stock of pure knowledge than did the Great Renewal, and while witnessing a less thorough-going material change than did the Industrial Revolution after the general adoption of the steam-engine, did more than any other period both to bring under the reign of natural law the social disciplines, philosophy, religion, law, education, and even literature and art, and also to propagate the scientific spirit among the masses.

Naturally this propaganda of reason found its principle and justification in mathematics, that language of pure reason. Many thinkers of the Enlightenment believed that the whole of nature, including man, could be brought under the sway of mathematics. While Newton expounded the arithmetic of the cosmos, La Mettrie claimed to have discovered the calculus of the human mind, and Quesnay to have formulated the equations of economic and social life. "A mathematician," opined Johann Bernoulli, "is well qualified to prosecute all sciences"; and his son Daniel added:

"I am not ashamed to say that what the Reformers did for our holy religion, that the mathematicians have done for the arts and sciences." "Natural science is nothing but applied mathematics," quoth Leibniz. "All nature," said Voltaire, "is nothing but mathematics." Buffon and Condorcet agreed that "mathematics is the foundation of and key to the knowledge of nature." Gradually, the empire of number expanded far beyond the bounds of science. Fontenelle but expressed the common opinion of his age when, in an *Éloge* of 1731 he announced: "A work of ethics, of politics, of criticism, perhaps of eloquence, will be finer if it is made by the hand of a geometrician."

Together with mathematical deduction, empirical induction appeared to the philosophers of the Enlightenment as the other avenue to truth. The nature of things is understood not only by formulating their numerical and spacial relations, but by perception of their qualities in careful observation and experiment. To some extent, the exponents of these two schools opposed each other. Not only in science but in philosophy and in popular thought an attentive eye can notice the dichotomy between the two schools, between the experimentalists and the mathematicians, between the sensualists and the pure rationalists.

What both were agreed on was the principle that reason acquires truth by present mental processes and not by reliance on authority. In an introductory chapter on scientific method Bonnet states that only the book of nature should be read, and adds:

It is only since the renewal of philosophy that the study of biology has been taken up with attention and method. Before that happy epoch the study of nature was really nothing but the study of the opinions of certain philosophers.¹

The declining authority of the classics in this field is strikingly reflected in their diminishing use and in the smaller number of editions of them published. The sixteenth century published 89 editions of Pliny; the seventeenth century

¹ Bonnet: *Œuvres*, i, vi, xx.

43, and the eighteenth century only 19.² Not to the inspiration or genius of past ages, but to one's own eyes and mind should one trust for an understanding of all things. Not by intuition or by imagination is the road to reality discovered, but by painful examination.

Better telescopes [said Haller], rounder lenses, nicer divisions of an inch, better syringes and scalpels, did more to enlarge the realm of science than did the creative genius of Descartes, than did the system of Aristotle, or than did the deep erudition of Gassendi.³

An excellent exposition of the empirical method is found in a discourse pronounced by Musschenbroek at Utrecht in 1730.⁴ Nicely defining the measures required to attain exactness, warning of the dangers of error, he yet extolled experiment and observation as the only avenues to truth. His principles influenced Voltaire and the Encyclopedists, and even found an echo in a work on scientific principles written by Dr. John Mitchell of Virginia and published at Nuremberg in 1748.

Even those who laid most stress on observation felt the need of colligating their facts in generalizations. This was made the more necessary not only by the vast accumulation of phenomena in each discipline, but by the growing apprehension of the unity of nature. The sciences, said Fontenelle in his history of the *Académie des Sciences*, have hitherto taken nature in little parcels; but the time will come, he prophesied, when these scattered members will be joined together in a single body. Even Bonnet, the great empiricist, allowed for laws "as the expressions of relations existing between things," and founded the invariable validity of these laws on the invariable uniformity of nature.⁵

That nature is not perfectly uniform, however, was perceived by some few thinkers of that age; and that her ap-

² Gudger in *Isis*, vi, 273 f. (1924).

³ S. d'Irsay: *Haller*, 19.

⁴ *De methodo instituendi experimenta physica*; see Brunet: *Physiciens Hollandais*, 68.

⁵ *Œuvres*, viii, 177 f.

parent uniformity, in many cases, is due to the law of averages and to the large number of facts dealt with, was perceived by at least one. Abraham de Moivre, a French Huguenot exiled to London, arrived most nearly at that statistical view of nature now held by so many physicists and philosophers. Devoting his mathematical genius chiefly to a study of probabilities, De Moivre first formulated, or adumbrated, the law of large numbers. This he explicitly stated, and applied to the study of natural phenomena, in the following words: ⁶

In all cases it will be found that although chance produces irregularities, still the odds will be infinitely great, that in process of time these irregularities will bear no proportion to the recurrence of that order which naturally results from the original design.

The classic exposition of the purely rational method of approaching nature, and the exposition which most influenced the thought of the Enlightenment, was that laid down by Newton in the preface to his greatest work. How significant, indeed, how immensely important as revealing and moulding the mind of the age, is the title he chose for his treatise on the cosmos: *Philosophiæ Naturalis Principia Mathematica*—the Mathematical Principles of Science! In the Preface, dated May 8, 1686, the author stated his purpose thus:

Since ancient writers made much of mechanics in the investigation of nature, and since more recent writers have undertaken to reduce natural phenomena to mathematical laws, the aim of this treatise is to pursue mathematics as far as it bears on philosophy.

He then went on to show that the difference commonly made between practical and theoretical science, between mechanics and geometry, is fallacious; for a perfect theory must correspond accurately to observed facts. In a true

⁶ H. M. Walker: *Studies in the History of Statistical Method*, 1929, 17. De Moivre's little-known article was published 1738.

science, he contended, the correct mathematical formulæ are deduced from the observed phenomena of motion; and from these formulæ, again, other phenomena of motion can be inferred and hence discovered. His own achievement in explaining the solar system by gravitation, and his hope that all nature might be illuminated by the same method, he set forth in the following words:

From the celestial phenomena, by means of the propositions mathematically demonstrated in the earlier books, we derive the force of gravity, by which bodies are drawn towards the sun and towards each of the planets. Then, further, from these forces by mathematical propositions are deduced the motions of the planets, comets, the sun and the moon. Would that we might derive the other phenomena of nature from mechanical principles by the same method of reasoning. For, many things make me suspect that all these phenomena depend on certain forces by which particles of matter, through causes not yet known, are either mutually attracted and cohere in regular figures, or else are mutually repelled and driven from each other; but because these forces are unknown philosophers have hitherto attempted in vain to master nature. But I hope that the principles here laid down will throw some light either on this hypothesis or on some truer one.

2. SCIENTIFIC ACADEMIES, JOURNALS, AND MUSEUMS

Except the press, no instruments served the propaganda of the scientific faith as did the learned academies and museums. The discovery of new knowledge is the work of the individual genius; but its diffusion is a social operation. The academies furnished platforms from which to preach the new doctrine, and emporiums in which it might be sought. So high did their authority stand in popular estimation that men now applied to them, as the ancient Greeks had applied to their oracles, for the solution of all the riddles of the universe and of daily life. New machines and new books were referred to their examination; inventors applied to them for patents, and authors for the crown of approval. The Czar expected the St. Petersburg Academy to tell him

how to build a bridge and how to regulate the currency; Frederick the Great asked the Berlin Academy whether it was profitable for the people to be deceived. Topics for dissertations were proposed by these learned bodies, and prizes given to the most meritorious essay; lectures and demonstrations educated the public; and large volumes of transactions and mémoires informed the learned. But, while the public eagerly followed them, and while most of the learned eulogized them, they had their enemies. Rousseau, the great rebel of the age, though his reputation was founded on an essay awarded a prize by an academy, declared: ⁷

It is proved to the hilt that the learned bodies of Europe are nothing but state schools of falsehood; assuredly the Academy of Sciences cherishes more errors than does the whole tribe of Hurons.

Of all the learned academies the strongest continued to be the Royal Society of London. For nearly a quarter of a century (1703-27) the world's greatest scientist was its president. It fitted out expeditions to the antipodes, and subsidized the publication of important works. Its *Transactions*, published quarterly and bound in handsome volumes annually or biennially, opened new avenues of research and furnished a guide to territory already explored. Beginning with 1753 it awarded prizes for the most momentous discovery or for the best work in the field of science; and it gave the very first of these prizes to Benjamin Franklin.

New life was given to the languishing *Académie des Sciences* at Paris by a reorganization in 1699. The constitution then granted, which remained in force until 1793, increased the membership to seventy, of whom ten were to be honorary members, twenty were to be Pensionaries, twenty Associates, and twenty Pupils. Of the associate members eight were to be foreigners. No priest should be elected, except as an honorary member. The regular members, or Pensionaries, were to be appointed only for distinguished publication. The duties of the Academy were the

⁷ *Émile*, Book III (vol. i, 370).

usual ones: to read books and judge them, to correspond with foreign scholars, to examine inventions, and to inform the public of their investigations by printing *mémoires* and by opening two annual meetings to all who wished to attend.

The labors of the Parisian *Académie des Sciences* were seconded by a large number of local bodies founded in imitation of it. By 1760 there were at least thirty-seven of these, one in nearly every French town of the slightest importance. Typical of these was the Toulouse *Académie Royale des Sciences, Inscriptions, et Belles Lettres*, chartered by the king in 1746, after it had existed informally as a club since 1729. Equipped with a telescope and with a botanical garden, it and its rivals in other cities did much to spread the popular taste for the study of nature.

The example set by France and England of establishing institutions for the cultivation of science was followed by Prussia and Russia as soon as they became great powers. It is a testimony to the value then set on research that an academy for its pursuit should now be felt as necessary to the equipment of a first-class state as were an army, a navy, a public debt, a splendid court, and a bevy of royal mistresses. On July 11, 1700, the Elector Frederick III of Brandenburg founded his Society of Sciences at Berlin; on January 18, 1701, he made himself King of Prussia. In 1724 Peter the Great, who had raised Russia to the rank of a European great power, founded his Academy at St. Petersburg.

Both of these institutions, however, owed more to the universal genius of Leibniz than they did to their high and mighty founders. Was there ever intellectual audacity equal to that of the Hanoverian councilor who, while building a calculus and a philosophy, evolved endless schemes for reforming world politics, for reuniting the churches, for creating an international language, for remodeling education, for enriching the material life and for stimulating the intellectual life of mankind, and for improving agriculture, manufacture, commerce, history, science, and art? One of his favorite plans for accomplishing these ends was the

foundation of a network of learned institutions. At the early age of twenty-one (that is, in 1667) he sketched the constitution of such a society to be founded by the Elector of Mainz. Though this society was never born, Leibniz continued, particularly after his visits to Paris and London, to labor for the establishment of German academies such as theirs. While at Hanover he supervised the education of Sophia Charlotte, the daughter of Electress Sophia. As she became not only his firm friend, but a most cultivated pupil, her marriage to Crown Prince Frederick of Brandenburg in 1684 gave her the opportunity to carry her master's ideas to Berlin. Though her plans to endow this capital with an observatory and an academy were opposed by narrow-minded Brandenburg statesmen, who saw in them a nefarious plot to extend Hanoverian influence, they finally interested her husband and induced him, twelve years after his accession to the Electoral Hat, to found the Berlin Society of Sciences.

The constitution, drafted by Leibniz, and modified by the Elector, provided not only for the study of the sciences, but for that of the German language, German history, and German law, to propagate Christianity in heathen lands, to supervise the book-trade and exercise censorship, and to maintain a lottery to raise funds. In other words, this new society was to combine the functions of a literary academy, a scientific academy, a board of foreign missions, a licenser of books, and a department of the public treasury—surely the strangest accumulation of duties ever laid upon the shoulders of a single body. In practice it did very little to send missionaries abroad, and much less, fortunately, to censor books than Leibniz had hoped. With a spirit of fine tolerance and cosmopolitanism it admitted to membership men of all nations and of other religions than the Lutheran.

But though from the start the Elector endowed the new corporation with a wealth of privileges, concessions, and subsidies, he endowed it with almost nothing of material value. Berlin was then a small town of 30,000 inhabitants; Prussia was a small state; the demands of the army and the court

taxed its scanty resources heavily. For ten years Leibniz and two or three other scholars labored to make bricks without straw and to produce visible results without material means. The saying that "Leibniz is a whole academy in himself" proved to be not only a compliment to his universal mind, but an almost literal description of the membership of the Prussian Society of Sciences for its first decade. In 1710 it published its first volume of *Miscellanea* containing sixty articles, of which twelve were by its great chief.

When at last it was organized and formally opened, in 1711, its troubles were not at an end—indeed they were only beginning. Though Leibniz had been named, in 1700, its first president, and though he had been assured a life pension, he was deprived, by mean intrigue, of both office and pension, and so did not attend the opening session in 1711. Notwithstanding his magnanimity which forgave enemies and gloried in the prospect of the Society's future greatness, when the first genius of Germany died, in 1716, the event was unnoticed either in Berlin or in London. Only in the Parisian *Académie des Sciences* was the passing of the mighty German commemorated in a noble eulogy by Fontenelle.

Under the step-fatherly care of Frederick William I (1717-40) the Society was starved, ridiculed, and abused. That barbarous tyrant, caring only for the army, barely tolerated the Society for the help it gave him in military engineering and medicine. For the rest, he used its members as his court fools, cuffed and kicked them when it suited him, and made them the favorite butts of his odious practical jokes. That, under the circumstances, it published five thin volumes of *Miscellanea* is greatly to its credit.

The Cinderella of Frederick William became suddenly the princess and darling of Frederick II, who deserves the epithet of "Great" not less for his enlightened love of the arts and sciences than for his military conquests. Within four years of his accession, after strenuous but interrupted efforts, he completely reorganized the corporation under the

new name of *Académie Royale des Sciences et Belles Lettres*. The new statutes, dropping the old provisions for foreign missions and for censorship of books, divided the membership into four classes: 1. Empirical philosophy (chemistry, anatomy, botany); 2. Mathematics (including mechanics and astronomy); 3. Speculative philosophy (including ethics and logic); 4. Literature (including antiquities, history, and languages). The most important innovation was the inclusion of metaphysics, now for the first time since the sixteenth century recognized as worthy of the attention of a learned academy.

Most important was the change of the official language from Latin to French. Papers might still be offered in German or in Latin, but all those published in the *Mémoires*, which appeared annually beginning in 1745, were to be written in, or translated into, French.

To give distinction to his academy Frederick combed Europe for scholars. As president he picked out Pierre Louis Moreau de Maupertuis (1698-1759) for his double qualifications of famous scientist and noted writer. Maupertuis's reputation had been made by his journey to Lapland to measure a meridian of latitude. When he came back to civilization he brought a dress of reindeer skins, which he wore on state occasions, a variety of odd specimens and pets, and two Lapp girls. Completely spoiled by the acclaim accorded his "journey to the pole," he never allowed his friends to forget it; nor did he ever harbor a doubt of his competence in all branches of human learning. In the same year in which he came to reside permanently at Berlin, he announced that he had discovered a new cosmological law of such universal import that it would not only illuminate the whole of nature, but that it constituted the first irrefragable proof of the existence of God ever advanced, for "it is so wise a principle as to be worthy only of the Supreme Being." This law was the principle of least action; or, to take his illustration, the principle by which he supposed that light, in reflection and in refraction, acts

so that a mathematical constant (the time-integral of the "living force") should always be at a minimum.

Unfortunately, he had erred both as to the correctness of his law and as to his originality in discovering it. When his colleague, Samuel König, pointed out to him that Leibniz had enunciated the law correctly—in the form that in certain cases the action is not a minimum but a maximum—he furiously retorted by accusing König of forging the letter of Leibniz he had cited. An appeal to the Berlin Academy resulted in the unjust verdict that König had really forged the letter.

At this point the matter might have rested but for the intervention of Voltaire, moved partly by personal jealousy of Maupertuis, and still more by the flagrant injustice to König. Whereas he had in 1738 written a poem to celebrate the "journey to the pole," he now changed the lines,⁸ in a second edition, to read:

Heroes of science, hail! Like Argonauts ye brave
The dangers of far climes, the perils of the wave,
To bring from that far land, ruled over by three kings,
Your measurements, Lapp girls, and other curious things.

Elsewhere he remarked that it was quite natural that Maupertuis should prove that the earth was flat at the poles, for his writings made everything flat. When Maupertuis published in 1752 some popular works proposing, along with many sensible and practicable suggestions, such impossibilities as digging a pit to the center of the earth, founding a city in which only Latin should be spoken, and vivisectioning criminals, Voltaire fell upon it first in a review and then in a satire called *Histoire du Docteur Akakia et du Natif de Saint-Malo* (1752). In this pamphlet Maupertuis is pilloried as the native of Saint-Malo, by one Dr. Akakia (or, Guileless) representing Voltaire. When the man attacked challenged Voltaire to a duel, the latter excused himself on the ground of ill health, but added that if he were well he would soon reduce his adversary to the principle of least

⁸ Look back to p. 89.

action, which is death, by a pistol bullet going at the square of its speed. Frederick, insulted in the person of his academician, wrote Voltaire that his works deserved a statue and his conduct the galleys; and, though usually tolerant even of libels on himself, he condemned *Dr. Akakia* to be burnt by the hangman.

More oppressive than internal dissension and than the ridicule of Voltaire was the Seven Years' War (1756-63), a grim conflict of Prussia against a coalition of European powers, in which all the resources of the state were absorbed in battle, and in which the foe invaded the land and captured Berlin. Even in these dire circumstances the Academy continued to do manful work for the cause of civilization. After the death of Maupertuis (1759), d'Alembert was made a sort of honorary president, while the office of vice-president, together with the power of regulating the affairs of the society, was held by Frederick himself. Notwithstanding his love of learning, his administration was not altogether successful. Through his own ungraciousness he lost Euler to St. Petersburg; and he so greatly disliked the election of Lessing to membership that after that event he deprived the members of their power of choosing their colleagues.

While war, wit, and despotism made hard the path of the Prussian Academy, a sister institution was struggling into life and fame in another rising state. Though founded after the death of Leibniz, the St. Petersburg Academy of Sciences deserves to be called his child. Being one of those cosmopolites, as he told Czar Peter, less passionately addicted to their country's glory than bent upon serving all mankind, Leibniz labored tirelessly to cover the whole of Europe with corporations dedicated to research. With that lively intelligence that won the epithet of the Great, and with that keen ambition to make Russian civilization equal in all respects to that of the West, Peter summoned Leibniz to him at Torgau in 1711, gave him an office and a pension, and commissioned him to draft a plan for an Imperial Academy. With alacrity the German philosopher complied, furnishing

a plan more comprehensive than had been even the one he had offered to Prussia. According to this the new society or academy should not only promote scientific research, but should superintend schools, the book-trade, the selling of drugs, mines, inventions, manufactures, agriculture, and commerce. Economic difficulties and the pressure of politics postponed the establishment of the society for many years; but the Czar never lost sight of his purpose, and in the last year of his reign (1724), actually founded the Imperial Academy of Sciences in his new city of St. Petersburg. Its publications were in Latin; its constitution was modeled on the plan of Leibniz.

After the death of the Czar, his widow and successor Catherine I carried out his intentions by summoning eminent scholars from all quarters of Europe. Among the most distinguished to obey the call were Nicholas and Daniel Bernoulli and Leonhard Euler. Though by 1727 the society was given a new house and a printing press, the conditions, both material and intellectual, were bad. The pay, none too generous, was often in arrears; the letters of the academicians were opened and searched by the police; the jealousy of the Russians, who were hardly represented in their own academy, and the demands of the government for practical service, harassed the members. Under these circumstances it is remarkable that they succeeded in publishing a volume of *Commentaries* almost every year beginning with 1726. That these *Commentaries* were of great value was due to the contributions of Euler and the Bernoullis. The first volume contains no reviews, and nothing on theology, literature, or metaphysics. Of the twenty-six articles twelve are on mathematics, ten on physics or biology, one on astronomy, and three on history. All of these last are by Theophilus Siegfried Bayer; two of them describe the ancient Scythians (regarded as ancestors of the Russians); and one of them treats the Chinese Wall.

With the progress of time, and particularly after the accession (1762) of Catherine II, that ardent disciple of the *philosophes*, the resources of the Academy increased and its

labors expanded. Particularly in the exploration of Siberia and of the coasts of Kamchatka and Alaska, it accomplished notable tasks.

The smaller nations of Europe hastened to follow the example of the greater ones in establishing learned bodies. The Scientific Society founded at Upsala in 1710 was followed by the more important Academy of Science at Stockholm in 1739. A similar Society for the Advancement of Science was organized in Denmark in 1743. In Spain elaborate plans for a Royal Academy of the Sciences were drawn up by Carvajal y Luzán in 1754 on the model of the French and Prussian societies; but these plans were not officially sanctioned. They are interesting testimony, however, to the need felt by Spanish scholars of institutions with more life than the universities then possessed, for the cultivation of the Spanish language, history, philosophy, mathematics, and classical scholarship.

Not only the Old World but the New felt the compulsion of the age to incarnate scientific aspirations in institutions. From the first years of their colonization the Americans had been deeply interested in science and learning. Notwithstanding the fierce struggle for existence in the earliest decades, and notwithstanding the harder trial of an unexampled prosperity in the next age, the passions of the Americans had from the first been less absorbed in material than in spiritual and intellectual matters. Fair letters and the fine arts did indeed languish for a time in the frontier environment, but for science and education, with their practical as well as their ideal values, the colonists cared more than they did for anything on earth except religion and political liberty. For many years after the foundation of the Royal Society of London, however, the Americans formed no academy of their own because, as loyal subjects of the British king, they satisfied their needs and found cordial welcome in the metropolitan body. Before the Revolution eighteen colonials were elected Fellows of the Royal Society, of whom nine resided in Massachusetts.

Just as the foundation of the Prussian and Russian academies coincided in time with the rise of Prussia and Russia to the rank of Great Powers, so the foundation of an American academy marked the epoch of growing self-consciousness of American nationality. To Benjamin Franklin, that New World Leibniz, is due this important development. In 1727 he formed at Philadelphia a club of twelve members, called the Junto, to discuss in weekly meetings topics relating to morals, politics, or natural philosophy. Though scanty, the records show that this club continued to exist during the long absences of its founder, and that it was more formally reorganized and slightly enlarged in 1744. Franklin's purpose, set forth in a *Proposal for Promoting Useful Knowledge among the British Plantations in America* was

to form a society of virtuosi or ingenious men residing in the several colonies, to be called the American Philosophical Society. . . . The subjects of correspondence shall be: all new discovered plants, herbs, trees, roots, their virtues, uses, &c. . . . new methods of curing and preventing diseases; all new discovered fossils in different countries, as mines, minerals and quarries; new and useful improvements in any branch of mathematics; new discoveries in chemistry . . . all new arts in trade and manufacture . . . and all philosophical experiments that let light into the nature of things, tend to increase the power of man over matter, and multiply the conveniences or pleasures of life.

In the meantime, while Franklin was absent in England, in 1766, a new body was formed at Philadelphia under the name of The American Society for Promoting Useful Knowledge, and Franklin was also elected president of this. Three years later this society united with the few surviving members of the Junto under the title The American Philosophical Society for the Promotion of Useful Knowledge, and as such it has lived to this day. The minutes of this, and of its predecessor the American Society, are extant and unbroken since 1768. In that year there were 48 resident members in Philadelphia, and 71 corresponding members

in the other colonies and in other countries. Among the foreign members were Buffon and "Sir Charles a Linné."

The first important work of the Society was the observation of the transit of Venus in 1769, to aid in which they persuaded the Pennsylvania Assembly to grant them £100 for telescopes. The work was done so well as to win the thanks and commendation of the Royal Society, and "greatly to promote the credit of the American Society." The minutes show that many other subjects of theoretical and applied science were considered; among them plans for promoting agriculture and for studying the fauna and flora of the New World bulking large.

The first volume of the *Transactions of the Philosophical Society*, published in 1771, compares favorably in size and in the quality of the articles with the publications of the European academies. Copies of it were sent to learned bodies in Sweden, Germany, Russia, England, Scotland, Ireland, France, and Italy; also to the British Museum, to the universities of Oxford, Cambridge, Dublin, Glasgow, St. Andrew's and Aberdeen; and also to various noted scientists in all parts of Europe. Many of the European Academies reciprocated by the gift of their own *Transactions*; and many other learned bodies and men sent gifts of books. Unfortunately the labors of the Philosophical Society were interrupted by the sterner work of war, so that no more volumes of *Transactions* were published until 1789. Franklin continued to fill the office of president until his death in 1790.

In addition to the reports of the learned corporations, a large number of journals, either continued or founded during this period, served the need of science. The *Journal des Savants*, written in French and bound in convenient duodecimo, appealed to the cultivated public as well as to the specialist. The more massive *Acta Eruditorum* continued throughout the whole period to review in Latin all important works on theology, history, geography, law, philology, medicine, mathematics, and the natural sciences. The *Acta Physico-medica* began to be published at Nuremberg in

1727; a journal of science in Italian was founded at Venice in 1728;⁹ the *Göttingen Journal of Learned Matters*, in German, began in 1739;¹⁰ a Swiss scientific journal at Basel in 1751.¹¹ Nor were journals of popular science lacking. One published at Gotha and Frankfurt during the six years 1792-97, set forth its program in the following comprehensive title-page:

News of the Learned and Curious World, in which is contained the Quintessence of manifold Learning, and remarkable things in History, Chronology, Genealogy, Geography, political intelligence, astronomy, the law of nature, the civil and administrative law, theology, political science, ethics, physics, medicine, philosophy, philology, military and civil matters; in which also many old and new books and authors are noticed and criticized; and not a few notices of persons important in station, in office, in the army, and in learning, are intermingled; faults and needs of all sorts are pointed out; good doctrines are taught; and the means of learning many sciences are given; and finally many pleasing stories and merry jests are added, and all is briefly treated by the collaboration of a curious and learned society and so gotten up that by this one may obtain a gentleman's Erudition. Published Monthly.

Hardly less than the learned journals did the museums serve as depots for storing and as show-windows for exhibiting the wonders of science. Such collections of all sorts of interesting objects, not unknown to earlier ages, were vastly multiplied and enlarged during the Enlightenment. At first they were usually the property of wealthy dilettanti, then they were made by universities, finally by the state governments. In earlier times such a collection was known as a "cimeliotheca" or "rarothea." The word "museum," used by English authors of the sixteenth and seventeenth centuries as equivalent to "study," came in the eighteenth to mean "a repository of learned curiosities," as Johnson defined it. The French commonly used the word

⁹ *Raccolta d'opusculi scientifici e filologici.*

¹⁰ *Göttingische Zeitung von gelehrten Sachen.*

¹¹ *Acta Helvetica physico-mathematico-botanico-medica.*

"cabinet." All early collectors laid stress on the strange and monstrous, rather than on the completeness and classification of the common that is so much more instructive. Skeletons and stuffed animals and birds, the clothing and arms of distant nations, monstrosities, human skins dressed as parchment, books and objects of art from the Near and from the Far East, mummies and idols, ancient coins and lamps, "mermaids' skins," unicorns' horns, bones of giants, fossils, gems, specimens of amber and exotic flowers mingled in a disorderly profusion apt rather to excite the attention and to astonish the imagination than to inform the understanding.

Among the best of the early collections were those made by the universities of Oxford and of Leipzig, by King Christian V of Denmark—of which a sumptuous catalogue was published in 1696—by Franz Ernst Brückmann (1697-1753), of Wolfenbüttel, and by Albert Seba (1665-1736), of Amsterdam. This last, together with the anatomical instruments and specimens of Ruysch, was purchased by Peter the Great in 1716.

A distinct advance in the size and standard of museums was made by Buffon as Intendant of the *Jardin du Roi* (now called the *Jardin des Plantes*), in Paris. During the half century (1739-88) of his incumbency, he made both the botanical and zoölogical gardens and the annexed museum—the *Cabinet du Roi*—both monumental and educative. In fact, he intended both the outdoor and the indoor collections to serve as illustrations for his *Natural History*; his constant allusions to the exhibits imply that he expected the reader to use them as materials for the study of nature. In one passage¹² he set forth his idea of the educative value of museums:

Nothing is more capable of contributing to the advancement of natural history than the continued examination of the objects treated. . . . Collections of such objects, made not only at Paris but in the Provinces, are real proofs of the taste for natural history which, in this age, is widely diffused in France.

¹² Buffon: *Œuvres*, xiv, 155 ff.

The primacy for size, value, and diversity of objects, however, was secured by England in the founding of the British Museum in 1753. One of the greatest of collectors was Sir Hans Sloane (1660-1753) a physician of large wealth and of scientific attainments that were recognized by the honor of knighthood and by the presidency of the Royal College of Physicians and Surgeons and of the Royal Society. Partly by travel and partly by the purchase of large private collections, he had brought together, by 1725, no less than 5,497 mineral specimens, 804 corals, 8,426 vegetable specimens, 3,824 insects, 3,753 shells, 568 birds, 54 mathematical instruments, 20,288 coins and medals, 2,666 manuscripts, and other objects amounting in all to 53,000 items. This collection, much increased at his death in 1753, and worth in his estimation £50,000, he left to the British nation at a price of £20,000. In the same year Parliament appropriated this amount for the purchase of the Sloane collection, and other moneys for the purchase of the Harleian and Cotton libraries of manuscripts. The act founding the British Museum states its purpose in the following words:

Whereas all arts and sciences have a connection with each other, and discoveries in natural philosophy and other branches of speculative knowledge, for the advancement and improvement whereof the said collection was intended, do, or may in many instances, give help and success to the most useful experiments and undertakings.

Six years of labor were needed to erect the building which, in 1759, was opened to the public. Originally there were three departments: 1. Manuscripts and medals; 2. Natural and artificial productions; 3. Printed books. From that day to this it has been enlarged by private bequest and by public purchase that have maintained its position as the most valuable repository, on the whole, of the materials of learning. While its natural history collections have been surpassed, its aggregation of books and manuscripts, and perhaps of antiquities, remains unequalled.

3. POPULAR COSMOLOGY

Such museums, however, did far more than furnish materials for scholars. They became one of the great instruments of the education of the public and of the propaganda of the scientific spirit. Of the large crowds that came to gaze at exotic animals and plants, rare gems and Greek vases, Roman coins and Chinese weapons, two-headed calves, freaks, mermaids, unicorns and basilisks, most sight-seers found little but an afternoon's pastime, but a considerable number won a general insight into the world of nature and of history, and a respect for the explorers of it. Among the wealthy it became the rage to make a collection of fossils, or of insects, or of dried plants, as well as of manuscripts, pictures, and coins. Doubtless many of those who followed the current fashion had no deep knowledge of their own "cabinets," and deserved the ridicule of Pope: ¹³

Not for himself he sees, or hears, or eats;
 Artists must choose his pictures, music, meats:
 He buys for Topham drawings and designs,
 For Pembroke statues, dirty gods, and coins;
 Rare monkish manuscripts for Hearne alone,
 And books for Mead, and butterflies for Sloane.

But, as the counterfeit proves the existence of the genuine, so the very absurdities into which the dabblers in science fell prove the wide diffusion of the taste for it among the educated public, and even of an aptitude for it among a considerable number of them. Many of the writers of the age testify to their study of science. Montesquieu applied himself to geology and physiology; Rousseau to anatomy and chemistry; Diderot to anatomy and physiology; Thomas Gray to entomology on which he wrote a Latin poem; the boy Goethe made himself an electric machine out of an old spinning wheel and some medicine phials. Indeed nothing,

¹³ *Moral Essays*, iv, 7 ff.

except Buffon's animals, was as popular as Franklin's lightning rods and kites.

From the more intellectual centers the waves of interest spread to ever wider circles. While there were some gentlemen who ridiculed natural philosophers for inventing expensive machinery for cutting cabbages and for devising methods of incubating muck-flies,¹⁴ there were others, in the most fashionable circles, who discussed palingenesis, the origins of fossils, the mechanism of the body, the habits of insects, and even the properties of light and the law of gravitation. "Those sciences," observed Diderot, "least common in the past century become more common from day to day"; and he commented further on "the general movement towards natural history, chemistry, anatomy, and experimental physics."¹⁵ "The philosophic spirit," said Voltaire in the dedication of his tragedy *Alzire*,

has made so much progress in France during the last forty years that if Boileau, who dared to mock a woman of fashion because she had secret talks with Roberval and Sauveur, were still alive, he would be obliged to respect and to imitate those women who publicly profit by the instruction of Maupertuis, of Réaumur, of Merian, of Du Fay, and of Clairault—of all those learned men, in fact, whose object is to cultivate science and, by making it agreeable, to render it necessary to our nation. We live in an age, I venture to say, when a poet must be a philosopher and when a woman may dare to be one openly.

It was perfectly true that many women dared to be philosophers. First and foremost, Voltaire's mistress, the divine Emilie, wrote on fluxions and on gravitation. Madame Merian produced works of great value in entomology. The Queen of Sweden, Louisa Ulrica, cultivated science under the tuition of Linnæus. Women of fashion everywhere cherished, or affected, an interest in intellectual matters. Bettinelli, in a dialogue called *Love and Fashion*, thus describes a woman of the world:

¹⁴ Smollett: *Peregrine Pickle* (1751), chap. xcv.

¹⁵ *Isis*, vi, 363.

Natural history, chemistry and astronomy are her daily recreation; here you would see her collection of butterflies or of snails or of plants or of minerals, there a small furnace and alembics, and yonder microscopes and telescopes with which she observes the stars—especially Venus.

Addison tells of a lady's library containing, among the latest novels and works of devotion, Sir Isaac Newton's works, and "Locke on the *Human Understanding* with a paper of patches in it."¹⁶ In France Carré gave lessons to women in the higher mathematics; in Germany Leibniz expounded physics and metaphysics to the princesses of the House of Brunswick. Duverney at Paris made anatomy so much the fashion at one time that Mlle. Biheron fitted up her boudoir with wax models and corpses, and Mlle. de Coigny carried around in her coach a corpse to dissect as one might read a book.

To cater to this demand for instruction in the laws of nature a vast number of books were published. Dr. Johnson's opinion that "no man reads a book of science from pure inclination," is merely a paradox brought forward to support his assertion that "people in general do not willingly read if they have anything else to amuse them,"¹⁷ and is refuted by the long list of books of popular science then published in many editions and bought in increasing numbers. Some of these books, nay, some articles in the *Journal des Savants* and other good magazines, were worthless, purveying only to curiosity by the invention of fables. The ancient story of the basilisk whose glance killed was still repeated in some quarters; tales of talking dogs, of the existence of jumarts or hybrids of horses and cows, of frogs embedded alive in stones, of sparrows brayed in a mortar and resurrected by a chemical operation, played upon the credulity of the ignorant.

Fortunately, the most popular of the books eschewed fables, and some were the creation of the first geniuses.

¹⁶ *Spectator*, April 12, 1711.

¹⁷ Boswell: *Johnson*, iv, 218.

Nicolas Lemery's *Course of Chemistry* (1675) commended by nothing but its truth and style, was devoured like a novel or a satire, was published in many French editions, and was translated into German, English, and Spanish. Still more popular was Fontenelle's *Conversations on the Plurality of Worlds* (1686), which gave science its place as a branch of fair letters. Newton's discoveries were popularized in many works in all languages. Such were the various essays in this field of Voltaire; such was the *Newtonianismo per le Dame* by Francesco Algarotti published at Naples in 1737. Euler's *Letters to a German Princess*, expounding to a daughter of the Margrave of Brandenburg-Schwedt the laws of nature, originally published in French in 1760-61, were promptly translated into nine languages. Very popular, too, were the *Mathematical Recreations* of Ozanam and of Guyot, and the *Contemplation of Nature* by Bonnet. Much more comprehensive than this early "Outline of Science" was Oliver Goldsmith's *History of the Earth and of Animated Nature*, published in eight volumes in 1774. In this the author molded copious information drawn from Buffon, Ray, Willughby, Swammerdam, Réaumur, and other good authorities, into charming literature.

Among all the writers of that age, however, the double crown of scientific excellence and of literary art must be awarded to Buffon. Drawn to his subject, as Condorcet says,¹⁸ "by that powerful attraction which forces the mind to occupy itself with one subject, and does not leave the will free to withdraw from it," he yet found time to perfect one of the great styles of the great age of French prose, "knowing"—to quote Condorcet again—"that literary glory is, after that of arms, the most durable and brilliant and the least contestable." Assuredly he sacrificed something of austere accuracy to rhetorical effect. While his matchless pen evoked the fury of the tiger, endowed the horse with majesty, followed the proud flight of the eagle, and painted the colors of the humming-bird, it too often attributed to the animals human passions, virtues and vices, and depicted

¹⁸ *Œuvres de Buffon*, I, vii ff.

them chiefly in their relations to man, as his servants or as his enemies. But he won the reward for which he set out, "creating," as his eulogist truly observed, "for all men of philosophic tastes and cultivated mind a science which had hitherto existed only for naturalists." The first large edition of his book was sold in six weeks; two more editions followed in the first year, and almost innumerable editions for a long time after that. Translations into English, German, and Dutch still further diffused the information imparted by Buffon, and still further enhanced his fame.

Such being the popularity of the new studies, what was their effect upon the mind and culture of the race? The first thing that struck the common man, or at least the most obvious argument advanced by the professionals to enlist his interest, was the practical utility of science. The new constitution granted to the *Académie des Sciences* in 1699¹⁹ throws heavy emphasis upon this consideration. The promotion of useful experiments and undertakings is given in the act of Parliament founding the British Museum as justification for the expense. The preface to the first volume of the *Mémoires de l'Académie des Sciences et des Belles Lettres* of Berlin (1745) states that it was once necessary to prove the value of speculative science but that now it is universally admitted, for:

Things have greatly changed. The empire of prejudices which had already [in the last century] received some hard blows in that part of its dominion concerning the utility of speculative knowledge, is now entirely destroyed in this respect. A great mathematician, an able physicist, a writer excelling in any line whatever, are now regarded, as they should be, not only as men who do honor to their country by the sublimity of their attainments, but as useful citizens from whose labors are born, or at least may be born, discoveries of the utmost importance to the public.

Presently, however, men began to find the chief utility of science in the enlarged view of nature and in the increased knowledge it gave. This is the line taken by Frank-

¹⁹ *Histoire de l'Académie des Sciences*, 1699, Preface.

lin, in an article in his *Gazette* for October 3, 1735. The usefulness of mathematics he found in the strict logic that destroys ancient prejudices and extends the empire of reason. With perhaps undue depreciation of the earlier ages he said that "all our knowledge of mathematics and of nature, and the brightest parts of human wisdom, had admission among us within the last two centuries"; and on the analogy of recent progress he predicted a magnificent future for man under the universal sway of reason.

In similar vein La Mettrie proclaimed:²⁰

The first utility of the sciences is their cultivation, which in itself is a real and solid good. Happy is he who has the taste for these studies! Happier he who succeeds by their aid in freeing his mind from illusions and his heart from vanity!

Leibniz, too, was found among the prophets of reason. In one place²¹ he proudly enumerated the triumphs in modern times of invention and of history; in a letter²² to the Duke John Frederick, he wrote:

Leaving revelation aside for the present, I hold that natural reason gives us no greater means of advancing the glory of God and the perfection of men than considerably to enrich real and solid science. For, important discoveries in mathematics, or some surprising experiments in physics, are so many conquests of nature by the human spirit, and so many hymns sung to the Author of the universe.

Where the philosopher led the way, the man of the world, the man of letters, and the statesman, hastened to follow. Recommending his son to read Fontenelle's *Pluralité des Mondes*, Lord Chesterfield assured him that the vast and immense planetary system and the astonishing order and regularity of the innumerable worlds would excite his curiosity and give him a larger and juster idea of God. There are no writers, Addison assured his readers,²³

²⁰ *L'Homme-Machine*, ed. 1921, 53.

²¹ *Philosophische Schriften*, vii, 174 (c. 1670).

²² *Sämtliche Schriften*, I, ii, 154 (1679).

²³ *Spectator*, no. 420, July 2, 1712.

who more gratify and enlarge the imagination than the authors of the new philosophy, whether we consider their theories of the earth or heavens, the discoveries they have made by glasses or any other of their contemplations on nature. We are not a little pleased to find every green leaf swarm with millions of animals that at their largest growth are not visible to the naked eye. There is something very engaging to our fancy, as well as to our reason, in the treatises of metals, minerals, plants, and meteors. But when we survey the whole earth at once, and the several planets that lie within its neighborhood, we are filled with a pleasing astonishment, to see so many worlds hanging one above another and sliding round their axes in such an amazing pomp and solemnity. . . . But if we yet rise higher, and consider the fixed stars as so many vast oceans of flame . . . we are lost in such a labyrinth of suns and worlds, and confounded with the immensity and magnificence of nature.

Not less wonderful than the revelation of the infinitely great was the revelation of the infinitely small. In his early essay on the *Sublime and Beautiful* Burke,²⁴ possibly remembering a famous passage of Pascal,²⁵ wrote:

The last extreme of littleness is in some measure sublime likewise. When we attend to the infinite divisibility of matter, when we pursue animal life into those excessively small and yet organized beings that escape the nicest inquisition of sense; when we push our discoveries yet downward, and consider those creatures so many degrees yet smaller, and the still diminishing scale of existence, in tracing which the imagination is lost as well as the sense; we become amazed and confounded at the wonders of minuteness.

Such was the awe-stricken attitude of the intellectuals in the presence of nature revealed by science. How far was their mentality shared by the multitude? It is impossible nicely to define the boundaries of the new thought, because they themselves were vague and fluctuating. There was no sharp line between the instructed and interested on the one hand and the ignorant and careless on the other. Almost

²⁴ Part II, sec. 7 (1756).

²⁵ Look back to vol. i, 419 ff., of this *History of Culture*.

all men in all ages are necessarily more absorbed in their own private concerns than in anything else: in their livelihood and love and marriage and children and professional success. But, in modern times, as the leisure classes grow larger, as the pressure of the economic struggle slightly relaxes, as education diffuses the means of culture, the immaterial interests take a larger place in man's thought. And, in modern times, the interest in science has gradually encroached on the domains of religion and of politics, and perhaps on those of art and of poetry. That keen-sighted observer of the manners of his age, Joseph Addison, noticed that since the foundation of the Royal Society many men formerly absorbed in politics were now turning to science, which might therefore be regarded as a steadying and tranquilizing element in the state:

The air-pump [said he], the barometer, the quadrant, and the like inventions were thrown out to these busy spirits as tubs and barrels are to a whale, that he may let the ship sail on without disturbance, while he diverts himself with those innocent amusements.²⁶

Even those interested in politics were then a smaller class than now; still smaller was the class appreciative of more refined intellectual matters. The rustics of the eighteenth century still refused to believe, in the age of Enlightenment, that the earth is round and that it moves—though they were now ridiculed for their ignorance by the educated.²⁷

Into the mind of these educated classes penetrated more and more deeply the thought of a universe of inconceivable size and of amazing regularity. The ignorant man, says Buffon,²⁸ still thinks that the earth was made for his domicile, the sky for his spectacle, and all things for his needs and pleasures. But the instructed man appreciates his own littleness in proportion as he sounds the abysses of space and surveys the infinite richness of their contents.

²⁶ *Spectator*, no. 262, Dec. 31, 1711.

²⁷ Holberg in his comedy *Erasmus Montanus* introduces and ridicules such rustics.

²⁸ *Œuvres*, iii, 290.

And with this humiliation went the great exaltation of the creature whose mind had penetrated the secrets of the solar system and had solved the equations of universal law! How truly did Pope express the mind of the age in his apostrophe to Man: ²⁹

Go, wondrous creature! mount where science guides!
Go, measure earth, weigh air, and state the tides;
Instruct the planets in what orbs to run,
Correct old Time and regulate the sun!

4. POPULAR ETHNOLOGY: THE NOBLE SAVAGE AND THE CHINESE SAGE

When ideas originating in the laboratory or in the study obtain a wide currency, they are almost always transformed and to some extent deformed. Not only are they generally oversimplified and made cruder, but they often give rise to myths and legends with little recognizable relationship to the seminal thought that has furnished the catchword. But these myths, these false ideas, often turn the whole course of human thought, and influence the progress of civilization more than the discoveries of authentic facts. Any imperious want in the mentality of an age will call forth the fabrication of ideas to supply it. How much did the ideas of a still living Roman Empire and of a City of God influence the Middle Ages! How easily did the humanists of the Renaissance find what they wanted of heroism and of perfect wisdom in classical history! How much did the myths of an ancient Germanic freedom and of a superior Nordic race mould the thought of the nineteenth century!

So the needs of the eighteenth century called into existence the two myths of the Noble Savage and of the Chinese Sage. Neither the one nor the other can really be found in the voyages and authentic accounts of travelers. At most there were suggestions of the one or the other, and a background of appropriate scenery painted in. At first

²⁹ *Essay on Man*, ii, 19 ff.

in America and then in the South Sea Islands was found that luxuriant wilderness, suggestive of Eden, in which nature bountifully supplies the wants of the noble and nude inhabitants. Among the pagodas and formal gardens of a refined civilization sat the mandarin whose extreme courtesy, cultivation, and worldly wisdom smiled down upon the follies of the inferior European.

Of the popularity of the voyages telling something of far lands there can be no doubt. Besides the large number published separately, there were great collections eagerly bought and devoured notwithstanding their bulk. The London bookseller Churchill made one such collection which was often reprinted, in six volumes. Another compilation, in two folios, was published from the originals in the possession of Harley, the Earl of Oxford. More ambitious and popular was the *New Collection of Voyages and Travels* published by John Green in fortnightly installments in London during the years 1745 to 1747. The French publisher Prévost almost at once began a translation of the last named, and later added to it new material from the writings of his own countrymen. At Augsburg a vast collection of the relations of Jesuit missionaries was published, in thirty-two parts, during the years of 1726-55. The most important voyages, from the standpoint of new information and of popularity, proved to be those of Bougainville in French and of Captain Cook and his companions in English. Not until long after their first appearance was it discovered how these latter had been altered to suit the taste of the time. The sober and pedestrian journals of Captain Cook, of Joseph Banks, and of Dr. Solander, were put into the hands of one John Hawkesworth to print. Instead of reproducing them exactly, which would have entailed much repetition and the inclusion of many uninteresting records of the log-book, he conflated the three, excised the dull passages, and retouched the whole with reflections of his own in order to paint the savages more brilliantly in accord with the prevalent taste. Even so he did not please all his readers. The

judgment of Horace Walpole³⁰ that the entertaining matter in the three volumes would fill less than half a volume, and that of Albrecht Haller³¹ that "the work is but a jejune description of small islands all very much alike except the barbaric New Holland and the anthropophagous New Zealand," typify the general opinion of readers expecting something much more romantic than the mere facts could furnish. On the other hand, it is noticeable that the imagination of an ardent poet³² could be inflamed even by the hints of adventure and of exotism found in Cook.

The remarkable thing about almost all the authentic voyages and missionary letters is the amount of sober and trustworthy information given in a dispassionate and judicial style. No wonder that Bougainville prefaced his *Voyage autour du Monde* with a blast against the philosophers who, sitting lazily in their studies, denounce travelers as liars and their tales as moonshine. The few wonders then regarded as incredible, such as Captain Cook's description of the kangaroo and of the fish that hopped on land like a frog, have been amply substantiated. The descriptions of the Indians in the letters of the Canadian Jesuits speak of them without idealization or vilification. In contrast to the common representation of the Chinese as masters of all wisdom, the authentic description of a traveler, published in Churchill's *Voyages* in 1700,³³ after noting that the scholars are the noblest and most respected class in the Empire, adds: "Their sciences reach no further than morals, history, rhetoric, and astrology . . . their philosophy is full of extravagancies." To this is appended a very sober criticism of Chinese art and of Chinese laws, both then extravagantly admired in some quarters. In fact, the reader who patiently examines a large number of eighteenth-century travels will be inclined to pass upon almost all of them Dr. Johnson's

³⁰ Walpole's *Letters*, ed. Toynbee, viii, 303 (1773), with several other contemptuous references elsewhere.

³¹ Fischer: *Briefwechsel zwischen Haller und Gemmingen*, 1899, 128, anno 1777.

³² William Cowper; see D. Cecil: *The Stricken Deer*, 197.

³³ Vol. i, 48.

judgment on Lobo's *Voyage to Abyssinia*, which he translated in 1735. Here, he remarks, the reader will find natives described as they are, "neither devoid of all sense of humanity, nor consummate in all private and social virtues. Here are no Hottentots without religion, polity, or articulate language; no Chinese completely skilled in all sciences." Elsewhere, the same sturdy apostle of common sense opined that the current idealization of the savage was cant.

Cant or dream, the conception of the noble and unspoiled child of nature became one of the constituent elements in the mind of the age. It was evolved not so much in response to outward stimuli as in obedience to inward needs. The treatment of the savage in the literature of that time was guided by three interests, so aptly illustrated by a story now current that I cannot refrain from repeating it, trite though it is. According to this fable, when three writers of different nations were asked to publish books on the elephant, the Englishman, after a trip through Africa and India, produced a work on *Elephant-Hunting in the British Empire*; the Frenchman, after some study of natural histories and of zoölogical gardens, wrote *L'Éléphant et ses amours*; and the German, after three years' meditation and reading of philosophy in his study, published a voluminous treatise entitled *Wesen und Begriff des Elefanten*. This is exactly how the eighteenth-century writers treated the savage. Some hunted him in the interests of empire; many investigated his amours; many others evolved from their inner consciousness the idea of what he ought to be. The driving force behind this idea was the longing of a refined, highly civilized, and artificial society for a simpler, juster, happier, and freer world. The chief elements shaping the idea were *a priori* speculations as to the nature of man, reminiscences of classical and medieval tales, and, last and least, hints thrown out by contemporary explorers.

The erotic interest is so perennial that it would not be worth further remark, were it not that it took a special form and a new emphasis in the Enlightenment. Many causes then produced the greatest revolt from chastity that has

been seen between the fall of Rome and the beginning of the twentieth century. The nudity of the savages and their promiscuity, as described by some voyagers, seemed to many of the philosophers of that time desirable; the much vaunted freedom of the Indians and South Sea Islanders seems sometimes to reduce itself to free love. There was much suggestive material to be found in authentic reports. Bougainville discovered in Tahiti an earthly paradise in which the inhabitants were naked, unashamed, and amorous. His description of the Tahitian woman who, at his first approaching the island, climbed on the deck and stood before the hungry eyes of the sailors as naked and, he assures us, as beautiful as Venus, inflamed the mind of France. Without doffing the British attitude of moral superiority and reprobation, Captain Cook tells much worse things. He saw exhibitions at Tahiti (or, Otaheite, as he called it) at which the sexual act was publicly consummated in the presence of the queen and of the lesser chiefs and ladies; and he saw dances of the women which he calls too indecent and provocative to be described.

But Cook and other travelers found as much to praise as to blame in the morals of the savages. Even at Tahiti Cook found crime remarkably scarce because of absence of motive for it. Lacking wealth, the inhabitants found little incentive for violence and fraud; the general promiscuity and lack of jealousy left no room for breaches of a non-existent code. In other places, especially in the island of Suva, he discovered a morality of the purest description, and a society in which monogamy prevailed and in which murder, theft, adultery and even fornication were almost unknown. Most descriptions of the Amerinds, while admitting their cruelty, emphasized their hospitality, loyalty, and self-control.

Such were the slight materials from which the poets, novelists, and philosophers of the Enlightenment painted their heroic portrait of the Noble Savage. The phrase first occurs in Dryden's *Conquest of Granada* (1669), in which one of the *dramatis personæ* proclaims:

I am as free as Nature first made man,
 Ere the base laws of servitude began,
 When wild in woods the noble savage ran.

Not only scattered allusions to the subject abound in this poet, but in his *Indian Emperor* (1667) is found one of the first full-length portraits of the good child of nature. "Where," exclaims Cortez, the conqueror of Mexico,

Where, banished virtue, wilt thou show thy face
 If treachery infects thy Indian race?

A still more elaborate and highly colored picture of natural society was offered to the public in Mrs. Aphra Behn's *Oronooko* (1688). The hero of this book is a Negro of the most captivating beauty and of the noblest and most delicate manners. The first few pages describe the Indians of Surinam as follows:

These people represented to me an absolute idea of the first state of innocence, before man knew how to sin; and 'tis most evident and plain, that simple Nature is the most harmless, in-offensive, and virtuous mistress. . . . Religion would here but destroy that tranquillity they possess by ignorance; and laws would but teach them to know offenses of which they have no notion.

Presently the savage, usually a Huron, was brought on the stage and introduced into the novel as the critic of effete civilization. Such plays as Delisle's *Arlequin Sauvage*, and such novels as Voltaire's *Ingénu*, brought the Indian to Europe in order to reflect severely upon the vices of civilization. Finally came Rousseau, whose idealization of the state of nature prior to the introduction of arts and sciences became so fundamental to his systems of politics, religion, and education that it must be treated more fully in other chapters of this work.

Though less advertised by eighteenth-century philosophers, and though much less noticed by later literary historians, the Ignoble Savage played nearly as large a part in the thought of the age as did his good cousin. The ardent

apostles of cultivation reacted strongly against the rosy praise of the primitive, and in reply to it painted a picture of the natural brute that it would be flattery to call diabolic. For this they could find ample materials in the narratives of explorers; as is so often the case, the most opposite conclusions can be drawn by properly selecting the data. The Jesuit missionaries dwelt on the cruelty of the Indians, and many explorers reported human sacrifice and cannibalism. Captain Cook, who witnessed a cannibal feast, described also the mutilations and perversions of the savages, with the severe comment: "In a word, their ideas are so horrid and brutal that they seem to pride themselves on their cruelty and barbarity."

Certain novelists and philosophers followed this lead. Defoe makes Robinson Crusoe witness an anthropophagous rite, and puts into his mouth the consequent reflection:

My passions were fired with horror at the unnatural custom of the people of that country who, it seems, had been suffered by Providence, in his wise disposition of the world, to have no other guide than their own abominable and vitiated passions.

Later, however, Crusoe discovered in Man Friday an affectionate and loyal friend, and then learned that God had bestowed on savages the same sentiments, reason, affections, powers and passions as on civilized men.

In France certain plays, like Piron's *Fernand Cortez* (1744) represented the Spanish as heroes and the Indians as degraded brutes. Voltaire often expressed contempt for savages, even though he used them to satirize Europe. The article "Savages" in Diderot's *Encyclopédie* gives a very low estimate of the morals and happiness of the primitives.

The climax of denigration was reached by the Abbé Corneille de Pauw's *Recherches philosophiques sur les Américains* (1768-69), a work every whit as prejudiced and untrue to fact as is the gaudy picture of the savage by Rousseau. Convinced that everything in the Western hemisphere is degenerate and monstrous, the author asserts that no event in history has been so fraught with misfortune for

mankind as the discovery of Columbus. Adopting the common opinion of his age that syphilis was brought from America to Europe, he asserts that this was but the first of the dire consequences of the intercourse of East and West. The American climate, the American fauna, the American flora, are nothing but absurdities and prodigies; the soil is barren and the insects and reptiles are noxious. The Amerinds are described as a degenerate species, mentally and physically weak, cowardly, and stained with every vice and crime from sodomy to cannibalism. Even when the savages have not quite turned into hermaphrodites and orang-outangs, their brutal manners and bizarre customs brand them as an accursed race.

A more creditable rival to the Noble Savage than the diabolic cannibal was the Chinese Sage. Though known to a few Europeans in antiquity and in the Middle Ages, China did not really impinge upon the mind of the Occident until the eighteenth century. Towards the end of the seventeenth century the descriptions by Jesuits familiarized the educated public with some elements of Chinese civilization; and the first translations of the Chinese classics furnished materials for a just judgment of the philosophy and science of that ancient people. At the same time the demand for tea, silk, and for that delicate porcelain that began to be called "china," stimulated the import of objects of oriental art.

One of the first books on China to obtain wide popularity was Athanasius Kircher's description³⁴ of that country written first in Latin and soon translated into French. The first version of a selection of the Chinese classics to be published in a European language was Ignatius da Costa's *Chinese Wisdom*.³⁵ This was followed by a translation of Confucius in 1687, and by many other sinological treatises.

The effect of this new knowledge on the mind of Europe was considerable. Whereas Bossuet practically omitted the Far East from his universal history, Voltaire gave it a large place in his. Leibniz was the first of the great philosophers to search for and to find light in the East. His tract en-

³⁴ *China Illustrata*, 1660.

³⁵ *Sapientia Sinica*, 1662.

titled *The latest News from China* ³⁶ declares the civilization of that country to be one of the two great contemporary cultures, inferior to that of Europe in science, but superior to it in practical and political philosophy. He went so far as to wish that the Chinese would send missionaries to instruct Europe in natural theology, as Europe sent to her apostles of revealed religion. At one time he thought he found in the Chinese ideograms that perfect language of symbols that he so earnestly sought. In France, while Montesquieu studied the Far East for lessons in politics, Voltaire extolled its moral wisdom and tolerance.

The Chinese had his enemies and scoffers as well as his admirers. Frederick the Great wrote Voltaire that he would leave the Chinese to him and the Indians to De Pauw, finding himself quite enough occupied with the nations of Europe. Grimm turned a cold light on the rosy-colored Orient, and Rousseau cited China as another proof that civilization corrupts manners. And some writers, without caring the least for the Chinese Sage in reality, used him as a vehicle of satire. Such an one was Horace Walpole, with his *Letters of Xo Ho, a Chinese Philosopher at London* (1757).

³⁶ *Novissima Sinica*, 1697.

CHAPTER V

PHILOSOPHY

I. PHYSICS AND METAPHYSICS

As political history narrates the struggle of races, states, and classes for material gains, so intellectual history must record the competition of ideas, schools of thought, and forms of spiritual expression. Though generally bloodless, the latter conflict is not less charged with emotion, not less strenuously fought, and not less momentous in its results than is the former. The key to the intellectual history of modern times is the conquest by science of other forms of thought. Though the warfare of science and theology has been the only battle that has enlisted the passions of the multitude and the only one to be much studied by historians, the wars between science on the one side and metaphysics, art, and traditional morals on the other have been almost equally bitter, and not less decisive. All these struggles have ended in the victory of science and have enlarged her empire. To record this fact is not to justify the result. The historian must be impartial in this as he is in political matters. It is his duty to set forth the facts of the battle, not to judge the merits of the contestants. If world history is the world court, nevertheless the historian is nothing but the clerk who ascertains and publishes its verdict.

The Enlightenment witnessed an unusually hot battle between Newtonian materialism and various forms of the older metaphysical idealism. In the effort of Locke to reconcile the two enemies, in the determined attempt of Leibniz to turn the rationalist (or mathematical) side of the new science against the empirical (or physical) side, in Berkeley's savage attack not only on materialism but on the very

existence of matter, in the complete skepticism of Hume, and in the capitulation of philosophy to science in the works of Condillac and Holbach, we see the various stages of the long war by which science extended her empire to its utmost frontiers. Some provinces she was destined to lose, at least temporarily, under the onslaught of Kantian idealism; but the history of this later conflict lies beyond the bounds of the present volume.

The strategic point lay in the methodological principles of Newtonian physics. If they could be defended, victory would accrue to the materialists; if they could be stormed, to the idealists. The success of Newton's work depended upon the *a priori* assumption of two axioms: the simplicity and uniformity of nature and the identity of causes where the effects are the same. Second only to these as the substratum of his thought was the assumption of an absolute time, an absolute space, and an absolute motion. These ideas, derived partly from the current thought of his age, partly from the necessities of his method, really amounted to an unconsciously held metaphysics. As his work yielded in practice brilliant results he was almost bound to assume that the universe is of such a nature as to make his method of explaining it appropriate and successful. He therefore rejected "occult qualities supposed to lie hid in bodies and to be the causes of manifest effects" because, as he clearly saw, "such occult causes put a stop to the improvement" of science. To him nature appeared to be a great machine, explicable only by physical and mathematical laws.

From the standpoint of the philosophers the weakness of such a view lies in its lack of *a priori* metaphysical justification and its reliance wholly on *a posteriori* results. That a theory produces useful action is not, according to most philosophers, a good reason for trusting to its truth. Of late, however, the Pragmatists¹ have begun to assert that

¹ Especially Wm. James and John Dewey. For Dewey's comment on the scientific revolution of the seventeenth century, and its meaning for philosophy, see his *Quest for Certainty*, 1929.

the workability of a theory is the criterion of its truth. "The net outcome of the method of science," writes John Dewey, "is that action is the means by which a problematic situation is resolved." This resulted in a "definition of the nature of ideas in terms of the operations to be performed," and in "an emancipation of thinking from the necessity of testing its conclusions solely by reference to antecedent existence."

What the philosophers of the Enlightenment made of these principles will be the burden of the present chapter. At this point it should be noted, however, that the battle over these principles more and more transferred the interests of the thinkers from traditional modes of thought to science. It was due to Newton that philosophers were now forced to reckon seriously with science. Metaphysical theories became more and more disciplined by contact with experimental facts, until at last metaphysics was regarded as a pre-science, an investigation of the validity of mathematical and physical thought. This conception is clearly expressed in the *Mémoires* of the Berlin Academy of 1745, when Formey wrote: ²

Metaphysics is assuredly the mother of the other sciences, the theory that furnishes the most general principles, the source of the evidence and the foundation of the certainty of our knowledge. These fine qualities did not, it is true, belong to the metaphysics of the schoolmen, an ungrateful soil producing nothing but thorns and thistles. And as no other metaphysics was known when the principal academies were founded, this whole branch of philosophy was left aside with a sort of disdain, being regarded as an obstacle rather than as an aid to the expansion of knowledge. Some great geniuses, however, cultivating anew this portion of the empire of the sciences, have given it a completely new aspect. Instead of a dictionary of barbarous terms, we now begin to have a nursery in which every science finds, so to speak, its seed, and in which are born all the principles and notions that guide us.

² Cited by Harnack: *Geschichte der k. Pr. Akad. d. Wissenschaften*, i, 310.

A further assertion of the dependence of metaphysics upon science is found in Bonnet's introduction to his scientific works:³

Physics and natural history have a closer relation than is sometimes thought to metaphysics, even to the most transcendental metaphysics. It is always from objects of nature, or from ideas derived from sensations, that the most abstract notions are deduced. That marvelous operation by which a man generalizes his ideas more and more, by which, I had almost said, he spiritualizes them more and more, is nothing but a certain exercise of attention, aided by means of arbitrary signs. . . . Physics is, then, the mother of metaphysics; and the art of observing is the art of the metaphysician as of the physical scientist.

2. LOCKE

The first step of the philosophers who accepted the new science was the effort to absorb it and to digest it into the old categories. This is the first step of the apologists of every revolution—to convince the public that the new measures will not prove dangerous to their most cherished habits and prejudices. It is most interesting and suggestive to learn that the great champion of the Newtonian revolution in philosophy was also the chosen defender of the contemporary political revolution. In each case John Locke (1632-1704) sought to show that the innovators rather perfected than abolished the old system.

Sprung from the loins of an old Cromwellian soldier, educated at Westminster school and at Oxford, and a student and a practitioner of medicine, Locke early read Descartes and the leading scientists of the age to such good purpose that he was elected into the Royal Society in 1668. Drawn into public life by personal friendships and to the Whig party by inheritance and conviction, he became secretary to the Earl of Shaftesbury for three years (1672-75), traveled on the Continent, and then returned to England and to office in 1679. The vicissitudes of his party drove him to Holland

³ Bonnet: *Œuvres*, I, vi.

as a refugee in 1683, and brought him back to England and to higher office in 1689. Up to this time he had published little of importance, but had been maturing a series of works that appeared with astonishing rapidity in the next six years: *An Epistle on Tolerance* (expanded from a brief form of 1666) in 1689, *Two Treatises on Government* and *An Essay concerning Human Understanding* in 1690, an economic treatise in 1691, a pedagogical tract in 1693, and an apology for Christianity in 1695. The philosophical essay on the understanding was enlarged and improved in 1700.

Like all the author's works this was a tract for the times, intended to confute the enemies of truth in its own age, and to make firm the foundations of both religion and science. Impressed by the work of Boyle and Sydenham, of "the great Huygens and the incomparable Mr. Newton," the author declares that it is his ambition "to be employed as an under-laborer in clearing the ground a little and removing some of the rubbish that lies in the way of knowledge."⁴ But his purpose was no less to defend "the principles of morality and revealed religion," which he thought could best be done "by examining our own abilities, to see what objects our understandings were, or were not, fitted to deal with."⁵ He therefore set out to "inquire into the original, certainty, and extent of human knowledge, together with the grounds and degrees of belief, opinion, and assent."⁶

He thought he could solve the problem of the possibility and extent of human knowledge by examining the origin of ideas. Some philosophers, especially Lord Herbert of Cherbury, had held that certain ideas are innate in the human mind. Seeing that this theory placed an obstacle in the way of rational investigation, and particularly of scientific progress, Locke demolished it, and espoused the opposite hypothesis that the mind is a blank page at birth, and that

⁴ John Locke: *Essay concerning Human Understanding*, ed. by A. C. Fraser, 1894, i, 14.

⁵ *Ibid.*, 9.

⁶ *Ibid.*, 26.

all ideas enter it through experience. This theory, found in ancient and medieval times,⁷ was less original in its formulation than in its application. The passion with which the author attacks the doctrine of innate ideas shows how deeply he, like his age, resented the withdrawal of any subject from examination and the test of experience.

Defining "idea" as "whatever it is which the mind can be employed about in thinking," Locke declares that all ideas, even the seemingly complex and remote notions of space, time, infinity, substance, power, identity, and morality, enter the mind through the senses, or from reflective consciousness. He continues:

Let us suppose the mind to be, as we say, white paper, void of all characters, without any ideas—how comes it to be furnished? . . . Whence has it all the materials of reason and knowledge? To this I answer in one word: Experience.

Experience comes through sensation, and is then moulded by the various operations of the mind, such as reflection, retention (memory), and discerning (or judgment).

Further investigation of the extent and validity of the knowledge brought within the mind by ideas, and into the nature of faith and of probability, by which assent is extended beyond knowledge for the conduct of life, results in the discovery that knowledge is found to be either an intuitive, or a demonstrative, or a sensuous, perception of absolute certainty in regard to the agreement or disagreement of any given ideas. We can perceive: 1. Identity or diversity, 2. Relation, 3. Co-existence or necessary connection, 4. Real existence. Mathematical knowledge is therefore real, but not the knowledge of physics:

because we want perfect and adequate ideas of those very bodies which are nearest to us . . . We have no ideas of the particular

⁷ E.g., in Aristotle: *De Anima*, Book III; Hugo of Strassburg: *Compendium Theologiae* (early 13th century) in a manuscript reproduced in Arndt: *Schrifttafeln zur Erlernung der lateinischen Palaeographie*⁴, 1904, Plate 25; Bacon: *Novum Organum*, aph. 1; and an Oxford debate of 1614, reported in Ornstein: *Scientific Societies*, 249.

mechanical affections of the minute parts of bodies that are within our view and reach; we are ignorant of their constitutions, powers, and operations.⁸

While at first blush this assertion may seem to exclude the new science from the realm of knowledge, on careful consideration it is found to be the purest Newtonianism. What are excluded from the realm of knowledge and investigation are those occult forces or properties that Newton himself rejected; what is made a main part of the content of knowledge is the mathematical relationship that he was so expert in elucidating. This is the more evident in the light of Locke's analysis of the qualities of matter into primary and secondary. Those qualities declared to be primary because they would exist if no one perceived them, are "solidity, extension, figure, and motion," those qualities are secondary which depend upon perception, as, color and sound. Space appears when we use our senses of sight and touch; time is suggested by change; number is inculcated by every object of sense and by every thought.

The last chapters of the *Essay* investigate the nature of religious belief and the principles of morality, with results deeply congenial to the rationalism of the author and his age.

From the standpoint of philosophy Locke's most effective achievement was his critique of the idea of substance, or matter. His theory that the reality of substance could not be immediately known, but was merely a convenient fiction of the mind, justified the Newtonians for neglecting the occult nature of matter in order to explain its qualities and their relationships, and on the other hand prepared the way for the idealists who were presently to declare that if matter could not be known it could not intelligibly be supposed to exist. From the standpoint of the historian of culture, however, Locke's influence on popular thought constitutes his most memorable achievement. He became as much the typical philosopher of the Enlightenment as Newton was

⁸ *Op. cit.*, ii, 217 f., 231.

its representative scientist. Addison conveyed his ideas to the elegant world,⁹ and Voltaire declared:¹⁰

Anybody who has read Locke, or rather who is his own Locke, must find the Platos mere fine talkers, and nothing more. In point of philosophy a chapter of Locke or of Clarke is, compared with the babble of the ancients, what Newton's optics is compared with the optics of Descartes.

The poet Gray began a fine essay in Latin verse on *The Principles of Thought* with the following invocation to Locke:

From whence our knowledge doth begin; how springs
Memory to life, that slender chain of things,
How Reason gains late empire in the heart,
How wrath and fear and care and sorrow start,
All these I sing! Deign thou my song to grace,
O second glory¹¹ of our English race!
Let me but follow in thy footsteps, for,
As thou canst all things, lead me to the door
Of Nature, and unbolt the bars that guard
Her secrets and dark causes, for though hard
To know, thou mighty priest canst read the hearts
Of men, and penetrate their inward parts.

Though much of Locke's metaphysics, and still more of his theology and psychology, has decayed under the erosion of time and of criticism, his *Essay* must still be reckoned the first attempt on a grand scale, and on Baconian principles, to estimate the certainty and adequacy of human knowledge. In excluding "the physical consideration of the mind," and in making his investigation introspective, Locke suffered from the limitations of his age. But in the ruthless application of sense and reason to mental science, he exemplified the strongest elements of his age, and thereby won a permanent place in cultural history.

⁹ *Spectator*, no. 413, June 24, 1711.

¹⁰ Voltaire: *Œuvres*, 1826, vol. lxiii, 29 (anno 1736).

¹¹ Locke, called the "*lux altera Angliacæ gentis*"; or the "second light of the English race." Newton was thought of as the first.

3. LEIBNIZ

A profounder, and therefore less popular, exponent and critic of the new science was Leibniz. Indeed, so profound was he that his doctrines did not come into their own until the rise of Relativity. Most instructive is the comparison of Locke and of Leibniz. Both were drawn to public life, Locke as the champion of the Revolution, Leibniz as the adviser, in finance, foreign policy, law, and administration, of Duke John Frederick of Hanover. Both were immersed in the Newtonian science. Both were apologists of religion. But in most other points they diverged widely in method, interests, and results. Locke composed a great formal treatise; Leibniz disclosed his views in letters, commentaries, and criticisms of other men—his theory of time and space as a supplement to Newton, his psychology as a review of Locke, and his theodicy as a refutation of Bayle. The metaphysics of both depended upon the new sciences, but upon different sciences. Locke, the sensualist, called physics as his crown witness; Leibniz, the rationalist, assimilated his doctrine to the processes of the calculus. "I see," he wrote to Bossuet in 1694,¹²

I see that most of those who like mathematics have no taste for metaphysical reflections, and find light in the one and darkness in the other. The principal reason of this appears to be that general notions, which are believed to be the best known, have become ambiguous and obscure by the negligence of men and by their careless method of explaining themselves, and it has gotten to the point where common definitions are supposed to explain the nature of things, though they do not even explain their names. This evil has infected other disciplines which are subordinate to this primal and architectonic science. Thus, instead of clear definitions, they have given us little distinctions; and instead of general axioms they have given us rules of classification which admit of as many exceptions as inclusions. And yet men are commonly

¹² *Correspondance de Bossuet*, vi, 523.

obliged to employ metaphysical terms and flatter themselves that they understand what they are accustomed to talk about.

Profoundly impressed by the achievements of his calculus, and led by his genius to master almost every branch of human knowledge, Leibniz made it the supreme aim of his life to unify all sciences by subjecting them to a single method, and this method essentially a logical calculus. By this means he believed that he could make reasoning in all branches easy and certain, and could invent the art of inventing. This was the "universal science" which he pursued all his life, and which he defined as ¹³

that which contains the principles of all others, and the method of using those principles, so that anyone gifted with even mediocre talent shall be able, when he descends to the special sciences, by easy meditation and brief trial to understand even the most difficult things and to discover the most beautiful truths and the most useful operations, as far as possible to man in the given circumstances.

The method employed was the invention of a universal language with an alphabet of characters somewhat similar to mathematical symbols and subject, like them, to manipulation in order to solve problems. The suggestion for such a universal language came to the philosopher from earlier sources. A project very similar to that of Leibniz is mentioned by Descartes in 1629 as the invention of an unknown man.¹⁴ This first essay towards an ecumenical speech proposed a simple grammar and a vocabulary stocked from living tongues. Descartes's comment on it praises the plan not because it would furnish an international means of communication, but because it might allow a classification of human thoughts in a logical order, analogous to the logical order in mathematics, and hence facilitate reasoning.

The idea was taken up by Dr. John Wilkins (1614-72) a versatile and brilliant man connected with Oxford and Cambridge, Bishop of Chester, and secretary of the Royal Society. In 1641 he began to compose a philosophical lan-

¹³ *Philosophische Schriften*, vii, 3. ¹⁴ Descartes: *Œuvres*, i, 76.

guage or universal alphabet, in which three thousand symbols would express all possible ideas. Among several others to develop the suggestion of Wilkins, George Delgarno, with his help, perfected it sufficiently to publish an *Ars Signorum* in 1661. The project so interested the Royal Society that it commissioned Wilkins to prepare a definitive work on the subject, which he published in 1668 under the title *Essay towards a Real Character and a Philosophical Language*. He now classified all ideas into forty categories. Hooke praised the new language as "so truly philosophical and so perfectly and thoroughly methodical that there seemeth nothing wanting to have the utmost perfection."¹⁵

Nevertheless, Leibniz thought he could bring the new alphabet to a higher perfection by introducing improvements from the Chinese and from his own mathematical algorism. In order to get all possible light on the Chinese ideogram he corresponded with Jesuit missionaries. As the inventor of the symbolism of the calculus he cudged his brains to discover this logical symbolism. Classifying all ideas into a few great categories and representing each category by a simple sign, such as a square, a circle, or a triangle, he introduced the necessary refinements by adding other lines according to fixed principles. The utility of the new language he explained in a letter to his sovereign, John Frederick of Hanover:¹⁶

Besides its use in commerce and in international communication (which will recommend it to the vulgar) it will have incomparably greater advantages, for it will provide the means of reasoning on matters susceptible of rational treatment by a sort of infallible calculus.

It was to be an infallible calculus because the human mind, unable to grasp and still less able to manipulate things in themselves, is able to work with symbols. Indeed, according to Leibniz, "while we have ideas of simple things, we have only symbols of complex things." These symbols he called

¹⁵ Huygens: *Œuvres*, vii, 524.

¹⁶ Leibniz: *Sämtliche Schriften und Briefe*, ii, 122.

"characters," which he defined as "certain things by which the relations of other things among themselves is expressed, and which are more easily treated than the things themselves." By means of these characters problems for which the data are fully given could be solved with certainty; and problems for which the data are only partially given could be solved in terms of probability, and with the degree of that probability indicated. In all this Leibniz was two centuries ahead of his time. He was a pioneer in the development of that symbolic logic that is one of the most important lines of contemporary thought.¹⁷

Equally alive today is his critique of Newtonian time, space, and matter, revived as that critique has been in Einstein's Relativity. That time and space cannot be absolute he proved by supposing that everything in the universe should be either expanded or contracted on the same scale and simultaneously; and by supposing again that the rate of change in everything should be either accelerated or retarded equally and at the same time. In either case the observer would notice no difference. Nor is space itself, he thought, what it appeared to Descartes, a postulated substratum of matter. Rather it appeared to him that extension must be gradually generated, that even the elements of geometry must come to the mind by calculation. Extension, therefore, is recognized as secondary, a result of generation by a moving point. So space becomes a system, a general thought-out sum of possible relations of a certain type. Space is the order of co-existence, time the order of succession of the mind's perceptions. These ideas were worked out in a correspondence with the English philosopher Clarke concerning Newton's *Principia*. Whereas Newton had held time and space to be absolute, Leibniz thought they were relative. "Absolute space," said he, "is an idol of the tribe in the thought of the English philosophers."¹⁸ In his con-

¹⁷ On this see the chapter on Leibniz in C. I. Lewis: *Survey of Symbolic Logic*, and D. Mahnke: "Leibniz als Begründer der symbolischen Mathematik," *Isis*, ix, 1927, 279 ff.

¹⁸ An idol of the tribe is a fallacy incidental to human nature in general. Look back to vol. i, 159.

ception, the theory of absolute real space and ever-flowing time would make it impossible to give the reason why any event happened at a particular time or in a particular locality. His own words are:

Suppose space to be something absolutely uniform; then, without things occupying it, there is nothing to differentiate one point in space from another. . . . It is the same in regard to time. Suppose someone should ask why God did not create the world a year sooner, and then should go on to infer from the fact that he did not, that God had done something for which no reason could be given why he had done it thus and not otherwise. . . . This proves that instants apart from things are nothing.

If, then, time and space are nothing but principles of arrangement, what is the stuff that is arranged? What is the true character of matter? To Descartes it had been extension; but, as Leibniz relegated extension itself to a mere matter of form, a methodological postulate, he could not agree with this conception. His maturest thought was that the physical is merely an appearance of the psychical reality—though, as an appearance it has a solid foundation. The only ultimate reality is a perceiving substance, *i.e.*, a soul, and what it perceives is something that impinges upon it, *i.e.*, a force. Force, therefore, is the real essence of matter. This force reveals itself as existing in small centers or units called monads. These ultimate elements of the universe are without parts, extension, or figure—hence they are, properly speaking, not material atoms but spiritual beings, the nature of which is to act, or move. This activity shows itself both in mechanical motion and in thought. Each atom moves not according to its own sweet will, but according to the laws of nature. Hence the beautiful harmony in all things mental and material, a harmony which was

preëstablished by a divine prevenient artifice, which from the beginning has formed each of these substances in so perfect a manner and regulated each with such precision that, in following the

laws received with its being, each yet accords perfectly with the other, just as though there were a mutual influence.

Or, in other words, the monads appear to act together just as two good clocks would keep perfect time, not because one acts upon the other, but because each has been made to move at the same speed as the other.

This doctrine of preëstablished harmony determined Leibniz's psychology which was developed as a critique of Locke's *Essay*. To Locke's fundamental principle that "there is nothing in the mind which was not first in the senses," Leibniz added the qualification "except the mind itself." In this profound comment lies the germ of Kantian idealism, the doctrine that our ideas are not bare reflections of things but are shaped by the action of the mind itself:

Our ideas [he explained] are not little images but are affections or modifications of our minds. Ideas of things not thought of by us are as truly in our minds unshaped, as the statue of Hercules is in the uncut marble.

This psychology was not given to the world until 1765 when, long after the author's death, his *Nouveaux Essais sur l'Entendement Humain* were published. His most important treatise, the *Monadology*, was also published posthumously, in a poor German translation, in 1720. In 1710 appeared the only complete philosophical work published during the author's life-time, the *Essais de Theodicée, sur la Bonté de Dieu, la Liberté de l'Homme, et l'Origine du Mal*.¹⁹ In a sense it was the crown of his labors in that it furnished the proof of his most cherished thesis that "this is the best possible of worlds." Not only by piety but by philosophical reasons Leibniz was drawn to this theory. Perhaps mathematics again gave the decisive suggestion and the form of proof. Nothing short of perfection is admitted in mathematical reasoning; nothing less than the best of all possible universes would comply with the requirements of so closely reasoned a cosmology as was that of the Hanoverian philosopher.

¹⁹ *Phil. Schriften*, vi.

Being perfect, God must choose the most perfect world of all those possible. But if the world is perfect, how can one explain the existence in it of evil? Leibniz answers that evil is of three kinds, each necessary to a higher good. 1. Metaphysical evil is willed by God as essential to created being. 2. Physical evil, or pain, is willed by God as the means to a greater good. 3. Moral evil is not willed, but is permitted by God because he foresaw that a world with evil would be better than a world without it.

Though tedious reading nowadays, the *Theodicy* edified, instructed, and even entertained the public of two centuries ago. In general, its optimism was congenial to the buoyant spirit of the age. But a few, and those among the greatest, balked at the inculcated doctrine as repugnant to common sense. Voltaire satirized the theory of the "best possible of worlds" in his *Candide* and rejected it elsewhere in the following verses:

Herr Leibniz cannot tell by what knot, strangely curled,
In this best possible and so well-ordered world,
Chaos is tied to law, and very real pain
Is mixed with all our joys and makes our pleasures vain;
Nor why the innocent should suffer the same fate
As he who for his crimes is punished, and his hate.

Nevertheless, in the face of Voltaire's ridicule, many of the ideas of Leibniz obtained wide currency in the eighteenth century. Either directly or indirectly the English stylists Bolingbroke and Pope got hold of the Leibnizian optimism and popularized in it the motto, "Whatever is, is right." In Germany rational thinking and some elements of the Hanoverian's thought were introduced to wide circles by Christian Wolff (1679-1754). While refusing to be called a disciple of the elder philosopher, he imbibed much from him to impart it first to his classes at Halle and then to the general public in a series of readable German tracts. His tendency to unite physical science with theology, and to treat the world as a machine, and his doctrine that nothing happens without a "sufficient reason" provoked an attack on him

by the pious theologians that led to his temporary removal from his professorship at Halle. For a time he found employment at Marburg, and then was recalled to Halle by his admirer Frederick the Great.

4. BERKELEY

Philosophy, like other forms of thought, to some extent leads an autonomous life. The metaphysics of Locke and of Leibniz cannot be represented merely as a reaction to the new physics and the new mathematics. Much of the thought of both is deeply rooted in the work of ancient and medieval philosophers. That there was a real kinship and a living interaction between the physics of Newton and the metaphysics of Locke on the one hand, and between the mathematics and the metaphysics of Leibniz on the other hand, is all that can be successfully asserted by one who sees in the advance of science the most important element in modern thought. A much more direct contact, and a bitterly hostile contact, between science and philosophy, is found in the work of Berkeley who declared the principles invoked by the mathematician to be inconceivable and the matter presupposed by the physicist to be non-existent.

George Berkeley (1685-1753) combined the characters of an Irish patriot, an American philanthropist, an eminent divine, a master of style, and a profound philosopher. Born in Ireland and educated at Trinity College, Dublin, he early read Newton, Locke, and the Deists only to conceive a strong aversion from their principles as subversive alike of religion and of common sense. Strange as his later theories sounded to the public ear, he nevertheless believed that he was defending the mind of the masses against the eccentricities of intellectuals as well as the faith of the fathers against the attacks of the wicked. In his diary he wrote: "In all things I side with the mob"; and again: "Use the utmost caution not to give the least offense to the church or to churchmen."

In 1709 he took Anglican orders and published his first

treatise, entitled *A New Theory of Vision*. When, in the next year, he published his work on *The Principles of Human Knowledge*, he had virtually completed, at the age of twenty-eight, one of the most astounding contributions ever made by any man to philosophical thought. Warmly welcomed by the leading English men of letters in London in 1713, he spent the next seven years, as chaplain of one aristocrat and tutor to another, in travels on the European continent. His scheme for evangelizing America led him to Rhode Island where he spent three years (1729-32) in writing a refutation of Deism entitled *Alciphron*, and in helping the young universities of Harvard and Yale. On his return to his native land he was appointed Bishop of Cloyne (near Cork in the south of Ireland) in 1734. In the years immediately following he wrote the *Querist*, an essay on the social state of Ireland thrown into the form of a series of questions. His last work, entitled *Siris: A Chain of Philosophical Reflections concerning the virtues of Tar-water* (1744) contains an extraordinary mixture of quackery, medical and metaphysical. Having learned in America that water with tar soaked in it was used as a simple specific for certain maladies, he became convinced that it was a panacea, and warmly recommended it as a sure cure of smallpox, consumption, pleurisy, erysipelas, asthma, indigestion, gravel, dropsy, gout, and many other diseases. To this hygienic advice he added a number of eccentric maxims on a great variety of matters.

Passionate devotion to religion is the key to Berkeley's mind. Indeed the apologetic purpose of his philosophy is frankly admitted in his works. The full title of his most elaborate work is *A Treatise concerning the Principles of Human Knowledge wherein the chief causes of error and difficulty in the sciences, with the grounds of skepticism, atheism, and irreligion, are inquired into*. The title of a popular exposition of his philosophy published in 1713 is *Three Dialogues between Hylas and Philonous . . . to demonstrate the reality and perfection of human knowledge, the incorporeal nature of the soul, and the immediate provi-*

dence of a Deity: in opposition to Skeptics and Atheists. Discerning in science the chief support of materialism, and in materialism the chief enemy of religion, Berkeley attacked this enemy by denying the reality of matter altogether. In his first essay, *A New Theory of Vision*, he maintained that visual consciousness is merely a system of arbitrary signs that symbolize for us certain actual or possible tactual experiences, that they are, that is, a purely conventional language. There is, therefore, no natural and necessary connection between the sensation of vision and the mind's idea of the object seen. What we know is our own perception, not an external object. Matter, if it exists, is unknowable to us, the concept is meaningless; the supposition gratuitous. His own summary of this doctrine is: ²⁰

That neither our thoughts, nor passions, nor ideas formed by the imagination, exist without the mind, is what everybody will allow. And it seems no less evident that the various sensations or ideas imprinted on the sense . . . cannot exist otherwise than in a mind perceiving them. . . . As to what is said of the absolute existence of unthinking things without any relation to their being perceived, that seems perfectly unintelligible. Their *esse* is *percipi*, nor is it possible they should have any existence out of the minds or thinking things which perceive them.

Locke had distinguished between the primary and the secondary qualities of matter, believing that the former exist in the thing itself, the latter only in the percipient mind. Berkeley tried to abolish this distinction, contending that all qualities of matter exist only in the percipient mind. He concluded: "There is no corporeal or material substance: it remains therefore that the cause of ideas is an incorporeal active substance, or spirit." The laws of nature are only "the set rules or established methods wherein the Mind we depend on excites the ideas of sense." Not only matter, but Newtonian time, space and motion are declared inconceivable. Thus the foundations of scientific materialism are done away, for: "The doctrine of matter or corporeal

²⁰ *Works*, ed. by Sampson, i, 180.

substance has been the main pillar or support of skepticism, and upon the same foundation have been raised all the impious schemes of atheism and irreligion." Instead of matter, the subject of science, the ultimate reality is spirit, the subject of religion. And this spirit must be God; for it is plain that

The works of nature, that is, the far greater part of the ideas and sensations perceived by us, are not produced by, or dependent on, the wills of men. There is therefore some other Spirit that causes them.²¹

The enunciation of so novel a doctrine caused a sensation not only in philosophical circles but in the great world. The ordinary man apprehended it as a paradox contrary to common sense. When that great preacher of common sense, Dr. Johnson, was asked by Boswell how he could refute Berkeley's idealism, he gave a stone a mighty kick and replied, "I refute it *thus*." Much the same method of rejecting it appears in one of Chesterfield's letters to his son, written in 1748:

Doctor Berkeley, Bishop of Cloyne, a very worthy, ingenious, and learned man, has written a book to prove that there is no such thing as matter, and that nothing exists but in idea; that you and I only fancy ourselves eating, drinking, and sleeping. . . . His arguments are, strictly speaking, unanswerable; but yet I am so far from convinced by them that I am determined to go on to eat and drink, to walk and ride, in order to keep that *matter*, which I so mistakenly imagine my body at present to consist of, in the best plight possible. Common sense (which, in truth, is very uncommon) is the best sense I know of.

From the study and the drawing-room some drops of the new philosophy trickled down to the servants' quarters. Fielding represents the house-keeper, Mrs. Slipslop, discoursing with Parson Adams "on the essence (or, as she was pleased to term it, the incence) of matter."²²

Berkeleian idealism found its warmest welcome in New

²¹ *Works*, ed. by Sampson, i, 246.

²² *Joseph Andrews*, ed. 1839, i, 9.

England, where, though at first regarded with indifference, it eventually obtained a considerable popularity. In 1770 John Trumbull, later known as one of America's first poets and then a precocious student at Yale, published a satire on philosophers, excepting from the authors ridiculed Berkeley as having "reconciled metaphysics and common sense" and as having "introduced metaphysics into the best company."²³

One of the most ardent champions of this philosophy in America was Samuel Johnson, not he of the stubbed toe and of the Boswellian biography, but a person at least as intelligent and far more liberal in his sympathies and ideas. Samuel Johnson of Connecticut (1696-1772), educated at the collegiate school at Saybrook later to be transferred to New Haven and to be called Yale College, by wide reading in the best English philosophers and divines, outgrew his earlier Puritan Congregationalism to take holy orders in the Anglican church. His great services to American education led to his election to the presidency of King's College (now Columbia University). When Berkeley came to America Johnson learned to know him, having already read his works which he admired as "the most surprisingly ingenious he had ever met with." In a letter to the author he raised eleven objections to the doctrine of idealism, but these objections having been courteously and fully answered, he became an ardent disciple. Like the Bishop of Cloyne, the American clergyman felt that this philosophy precluded skepticism, and ended doubt. Nor was he a blind, unthinking pupil. Further reading in other philosophers, especially in Malebranche, led him to modifications of the Berkeleian system, and his own thought suggested improvements upon it. In his principal work, *Elementa Philosophica* (1752) he set forth an idealistic metaphysics and ethics. In the former he advanced upon Berkeley in the direction of Kant by distinguishing pure intellect from sensation, and finding in both adequate sources of knowledge. The truths of mathematics, for example, he held to be intuitive, because

²³ M. C. Tyler: *Literary History of the American Revolution*, i, 206.

given with the nature of the mind. Similarly he founded his ethics on an intuitive moral sense.

A profounder thinker than Johnson was Jonathan Edwards (1703-58) who distilled the quintessence of Puritanism. Congregational minister, revivalist, missionary to the Indians, president of Princeton College, preacher of hell-fire and of mystic rapture, saint, and philosopher, he incarnated most of the best and some of the darker sides of early New England Calvinism. Nothing is more remarkable than the precocity which outstripped that of Berkeley unless it is the similarity of an idealism closely resembling his, but apparently worked out independently. Entering Yale College when not quite fourteen, he began soon thereafter to arrange his reflections in a series of notebooks under the headings: Mind, Natural Science, the Scriptures, and Miscellanies. The masters who formed his thinking at this early stage were chiefly Newton and Locke, whose *Essay* he read "with greater pleasure than the greedy miser finds, when gathering up handfuls of silver and gold from newly discovered treasure." Pondering on these writers he arrived at a doctrine of idealism so closely akin to that of Berkeley as strongly to suggest that it was derived immediately from him. Nevertheless, it is the opinion of most biographers of Edwards and of the leading students of American philosophy, that Edwards did not know Berkeley. The Irishman's writings, though published at Dublin a few years before Edwards went to college, did not at once obtain wide reading in England, and cannot be traced anywhere in America prior to 1722, some years later than the date of the Yale student's notes. Moreover Edwards, who frankly acknowledges his obligations to Locke and to other philosophers, never mentions Berkeley either in these notes or elsewhere. Finally, his idealism, though akin to that of Berkeley, is slightly different in accent and formulation. The resemblance between the two thinkers is but another of the many examples emerging in intellectual history of the same discovery being made simultaneously by two independent minds working on the same data with similar purpose.

Perhaps Berkeley and Edwards were both influenced by Cudworth.

After pondering the ultimate reality the precocious youth came to the conclusion that

that which truly is the substance of all bodies is the infinitely exact and precise and stable idea in God's mind, together with his stable will that the same shall be gradually communicated to us and to other minds according to certain fixed and exact established methods and laws.

The argument in support of this position starts from Locke's doctrine of colors as being secondary qualities of matter existent only in the percipient mind. All material existence is only idea; those things which may be supposed to exist unobserved by any created mind exist only in uncreated idea. Very striking is the argument, recalling Leibniz, that motion is relative. In fact, however, the whole argument, with all its points of resemblance to other philosophers, has an original note. With Berkeley the essence of things lies in their being perceived; with Edwards in their being conceived. This is not a distinction without a difference: it means that Edwards was the purer, more extreme idealist, laying reality in thought even more consistently than Berkeley had done.

5. HUME

After the Englishman had established the laws of scientific knowledge, and after the Irishman and the American had vindicated the claims of religious knowledge, there came a Scot to show that they were all mistaken and that man could really know nothing whatever. Like the frequent rain of his own country, Hume's skepticism poured a cooling shower on the warm sympathies of Locke and on the burning zeal of Berkeley and of Edwards. And yet, like a Scotch landscape, Hume's philosophy is pleasing in its own way. Lacking the decent and charming cultivation of the English countryside, and the wilder beauties of the Irish or

the American scene, the Scotch landscape presents to the eye a bold and naked beauty not unlike the quality that lends charm to the style of her greatest son. Hume is more readable and more read than any other philosopher mentioned in this chapter.

David Hume (1711-76) was "well connected." He passed through Edinburgh university with credit, and emerged from it with an intense interest in philosophy, history, and literature. Though poor, he declined the possible rewards of a business career to devote himself wholly to study and to fame. After traveling in France he published his first work, *A Treatise of Human Nature* (1739) which, in his own words, "fell dead-born from the press." A volume of *Essays* (1741) had greater success, and a *History of England* so much popularity as to make him not only independent but almost affluent. Other *Philosophical Essays* (1748), *Political Discourses* (1751), and *Dissertations* (1757) continued to develop his thought and to augment his fame. After living for some years in England, and again for some years as secretary to the British embassy at Paris, where he was warmly welcomed into the literary society of France, he settled in Edinburgh in 1769 and spent his last years cultivating philosophy and the friendship of Adam Smith. He died like a Stoic, facing an harassing illness not only with courage but with almost undisturbed serenity and cheerfulness.

In every respect a child of his age, Hume started his philosophical investigations with a supreme contempt for the earlier schools of thought that had taken their color from theology and their problems from *a priori* prejudices. In these characteristic words he threw them all overboard:

If we take in hand any volume of divinity, or school metaphysics, for instance, let us ask, Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it then to the flames; for it can contain nothing but sophistry and illusion.

The *Treatise of Human Nature* he described as "an attempt to introduce the experimental method of reasoning into the moral sciences." In other words, he approached the theory of knowledge with a full consciousness of the psychological point of view. He therefore found the most important task for the thinker to be the investigation of the nature of the human mind. Starting from Locke's doctrine that all knowledge is derived from outward impressions, and accepting Berkeley's inference that reality lies in the perception, Hume drew the logical conclusion that the mind, unable to know anything but its own state, can really know nothing outside of itself at all. Substance is an unknown thing and an empty concept; our own minds are not really known to us, for consciousness of subject comes only from consciousness of object; least of all is a God known to us, for the existence of such a being is only an inference, by faulty reasoning, from data in themselves totally unreliable. All our reasoning about matters of fact is based on the theory of cause and effect; but for this theory there is no good basis at all, except that supplied by habit. Having often perceived that heat comes with flame, we infer, without logical warrant, that it will always be so; having known the sun to rise every day of our lives we infer that it must rise tomorrow, though the mere repetition of an event is no logical proof. More than half our opinions are the result of early education, or inculcation during infancy; belief is an act of the sensitive and not of the cogitative parts of our natures: that is, it is due to impressions made upon the senses, not to logical ratiocination. The sum of this skeptical philosophy is most clearly expressed in the author's own words: ²⁴

If perceptions are distinct existences, they form a whole only by being connected together. But no connections among distinct existences are ever discoverable by human understanding. We only *feel* a connection or determination of thought to pass from one object to another. It follows, therefore, that the thought

²⁴ *Treatise*, ii, 551.

alone feels personal identity, when, reflecting on the train of past perceptions that compose a mind, the ideas of them are felt to be connected together and naturally introduce each other.

However extraordinary this conclusion may seem, it need not surprise us. Modern philosophers seem inclined to think that personal identity *arises* from consciousness, and consciousness is nothing but a reflected thought or perception. The present philosophy, therefore, has a promising aspect. But all my hopes vanish when I come to explain the principles that unite our successive perceptions in thought or consciousness. I cannot discover any theory which gives me satisfaction on this head. . . .

In short, there are two principles which I cannot render consistent, nor is it in my power to renounce either of them; *viz., that all our distinct perceptions are distinct existences, and that the mind never perceives any real connection between distinct existences*. Did our perceptions either inhere in something simple or individual, or did the mind perceive some real connection among them, there would be no difficulty in the case.

This is the most complete expression of an empirical, positive, humanistic agnosticism ever advanced. If knowledge has its source in experience, is limited to phenomena as reflected in the human mind, and cannot penetrate the nature of any supposed ultimate substance, of cause, or of the external world, it obviously amounts to nothing at all. Thus, in a complete negation, ended one line of thought in the philosophy of the Enlightenment. It really amounted to a critique of reason dangerous to the fundamental ideas of the Enlightenment itself, and thus prepared for a new age.

Though Hume's skepticism was not really answered until it awoke Kant from his dogmatic slumber, it provoked a number of replies and refutations of which the most popular at the time were those furnished by Hume's fellow-countryman, Thomas Reid (1710-96). In a series of works, of which the most important was the first, *An Inquiry into the Human Mind on the Principles of Common Sense* (1764) Reid endeavored to show that Hume's utter Pyrrhonism is refuted by the "consent of all ages and nations, of the learned and unlearned." He reasoned that, as "the

structure of all languages is grounded upon common sense," the distinctions in the meanings of words imply real distinctions; for example:

the distinction between sensible qualities and the substance to which they belong, and between thought and the mind that thinks, is not the invention of philosophers; it is found in the structure of all languages and therefore must be common to all men who speak with understanding.

In other words, our belief in the existence of matter, in the reality of the law of cause and effect, and in all the postulates of common sense, is proved by the universal consent of mankind as shown in their speech.

This philosophy enjoyed much popularity not only in Britain but in America, in France and in Germany. Goethe said of it: ²⁵

The reason why foreigners—Britons, Americans, Frenchmen, and Italians—can gain no profit from our new [German] philosophy is simply that it does not lay hold directly on life. As they can see no practical advantage to be derived from it, they turn more or less to the Scotch school as it is expounded by Reid and Dugald Stewart. Because it is intelligible to the ordinary understanding, this teaching wins favor. It seeks to reconcile sensationalism and spiritualism, to effect the union of the ideal and the real, and thus to create a satisfactory foundation for thought and action.

6. THE FRENCH MATERIALISTS

From Locke, as from a fountain-head, flower two great streams of philosophic thought—the British and the French. They flowed, however, in almost diametrically opposite directions. While the English school developed extreme idealism, the French grew into extreme materialism. Each school was perfectly logical. Philosophical systems are generally distinguished by good reasoning. The divergencies in their conclusions are due to differences in their premises; and

²⁵ Quoted by P. Hume Brown: *Surveys of Scottish History*, 1919, 117.

these, in turn, are due to variety of temperament and of social heritage. In England a policy of toleration, moderation, and good-humored conservatism allowed religion to keep the affections of the people and of the educated classes; in France spiritual tyranny created in many thinkers a fierce hatred of religion and a disposition to embrace whatever doctrine would do her most harm. Hence her philosophers rushed to a doctrine of scientific materialism as the most effective weapon in attacking theology.

The way was prepared by a man who still cherished a belief in God and in immortality, though not in revealed religion. Étienne Bonnot de Condillac (1715-80), having taken holy orders in his youth, was soon entrusted with the education of an Italian prince and later endowed with the revenues of an abbey. Inspired by the conviction that "the science which contributes most to make the mind lucid, precise, and large, and which should therefore prepare for the study of all other sciences, is metaphysics," and convinced that it could be studied by the scientific method, he composed a *Traité des Sensations* (1754) in order to expound the ideas of Locke and those of the current popular science which he knew chiefly through the works of Fontenelle. The first pages set forth his purpose as follows: ²⁶

The principal object of this work is to show how all our knowledge and all our faculties come through the senses, or, to speak more exactly, through the sensations: for, in truth, the senses are only a means. They do not feel; it is the mind which feels by means of the organs; and it is from the sensations that modify it that the mind draws all its knowledge and all its faculties.

To illustrate and to prove his doctrine he imagines a statue endowed with the sense of smell only. As it perceives a succession of odors it develops successively attention, pleasure and pain, memory, comparison, judgment, astonishment, imagination, passions, ideas, and all other faculties of the mind. Then Condillac endows his statue successively with the senses of hearing, taste, sight and touch, in the

²⁶ *Œuvres*, iii, 3.

course of which the ideas in its mind become more and more complex, until at last the full stock of human ideas is reached. This theory is the most vigorous attempt ever made to deduce all the processes of the mind from passive experience.

After Condillac had written, most French philosophers followed him rather than his master, Locke. He had the advantage, in their eyes, not only of writing French, but of making much more clear, precise, and pointed the ideas they needed in order to rationalize the pure materialism congenial to their prejudices.

The first of his followers was Claude Adrien Helvétius (1715-71) who began active life by amassing riches as a farmer-general and ended it as a philanthropist and a practical philosopher. His chief aim was to turn psychology to the profit of the state, to establish on the laws of nature a political science and an ethics conducive to universal happiness. As he saw in the church the obstacle to the realization of this aim, his savage attack on ecclesiastical ethics led to his condemnation by the archbishop of Paris, by the Parlement of Paris, and by the pope, and to his flight from France to that great refuge of the persecuted free-thinkers, Berlin. His most original work, *On the Mind* (1758), was followed by a more elaborate treatise *On Man* (1773-74).

The human mind, he sets forth, is endowed with the two faculties of receiving and of remembering impressions. From these two faculties flow all forms of thought. Errors arise from passions and from ignorance. Believing that, though men are endowed with different degrees of fineness of sense, strength of memory, and capacity of attention, all have enough of each quality to enable them to rise to the highest notions, he expounds the ethical and educational system that would most fully develop the faculties and insure the happiness of every man.

The culmination of the materialistic school came in the work of Paul Heinrich Dietrich d'Holbach (1723-89), by birth a German baron and by early denizenship, education, and sympathy, a French radical. His most important work,

Système de la Nature, published pseudonymously in 1770, justly called the Bible of materialism, rejected all spiritual causes: God in nature and an immortal soul in man; and explained all things in terms of matter and its fundamental property, motion. Even consciousness and thought Holbach reduced to a kind of molecular motion similar to fermentation and nutrition. His aims and premises are thus set forth in the preface:

Man is unhappy only because he knows not nature. His mind is so infected with prejudices that one might think him always condemned to err: the bandage of opinion with which his eyes were covered in infancy is so strongly tied that it can hardly be removed. . . . He wished to be a metaphysician before he became a physicist; he despised realities and imagined chimeras; he neglected experience and stuffed himself with systems and with conjectures.

In due order Holbach expounds the physical laws by which, in his opinion, the mind is governed. The mind, in fact, cannot be distinguished from the body and therefore perishes with it. All intellectual faculties depend on physical causes. All acts are fatally determined. There is no free will, no soul, no God.

This consistent materialism was so congenial to the intellectuals of France that it found wide acceptance in the more cultivated circles. Next to Holbach perhaps its strongest supporter was La Mettrie, whose *Man a Machine* has already been described as a contribution to physiology. Agreeably to his scientific investigations of the mechanism of the body, La Mettrie expounded a natural-scientific view of the universe. He, too, referred all mental processes to material factors, avowing that matter can think and that thoughts themselves are minute particles of matter lodged in the brain.

Among the more popular writers Diderot, in a work entitled *The Interpretation of Nature* (1754) tried to explain all phenomena in scientific and materialistic terms. Re-

fusing, as an atheist, to appeal to any cause outside of nature, he maintained that elements endowed with the capacity for life and consciousness had existed from all eternity. Voltaire, too, without sharing the atheism or extreme materialism of Holbach and Diderot, taught the public that man is governed by the same inexorable laws that regulate the rest of the universe. As he put it in his *Ignorant Philosopher*:

It would be very singular that all nature, all the planets, should obey eternal laws, and that there should be a little animal, five feet high, who, in contempt of these laws, could act as he pleased, solely according to his caprice.

Materialism found a welcome outside of France among those who harbored a dislike of revealed religion. The Irish Deist, John Toland (1670-1722) expounded this philosophy in a series of *Letters to Serena*—Serena being Sophia Charlotte, the Hanoverian princess and later Prussian queen, educated by Leibniz.

In America materialism flourished in the South as much as idealism had spread in New England. The one was congenial to the secular and plutocratic society of the planters as was the other to the pious and theocratic people of New England. Though the middle colonies ultimately declared for realism, one of them, New York, furnished the first great champion of materialism in the New World in the person of Cadwallader Colden (1688-1776). Born in Ireland of Scotch parentage, educated in medicine at Edinburgh, he migrated first to Pennsylvania in 1710 and then, after a return to England, to New York in 1718. Here he spent the rest of his life in active politics and in philosophical contemplation. Of a number of works surviving in manuscript, only one, *The Principles of Action in Matter* (1751) was printed. Familiar with Hobbes and with Newton, Colden expounded a materialistic conception of the ultimate reality. According to him, matter as a sublimated force and mind as spiritualized matter are not opposed substances

but possess a common denominator in the universally diffused ether of space. While this attempt to reduce mind and matter to phenomenal modifications of the same substance failed, Colden's panpsychism attained a convincing self-consistency.

CHAPTER VI

POLITICAL AND ECONOMIC THEORY

I. GENERAL CHARACTER OF THE POLITICAL THEORY OF THE AGE

As in other ages, so in the Enlightenment, the prevalent types of political thought sprang from two parents, the one intellectual, the other material. The common need, to examine, to justify, or to improve, the actual conditions of society, could be satisfied only by interpreting them in the light of the current science. The content of the political thought of the time was supplied by the study of actual governments; its form was borrowed from the more general intellectual conceptions then obtaining.

Of these the dominant element was supplied by natural science; and natural science, in the age of Newton, meant chiefly mathematical astronomy. Just as in the latter part of the nineteenth century almost everything was interpreted in the light of Darwinian evolution, so in the eighteenth century almost everything was explained by an implied comparison with celestial mechanics. From this science were derived the widely accepted ideas that everything is subject to natural law, and hence susceptible to scientific treatment, and that the proper method is the isolation, abstraction, and definition of universal forces and the deduction from them, by pure reasoning, of their consequences. That men and nations act under the push and pull of general attractions and repulsions, that all societies are machines, and that the art of politics is the proper balancing of opposite tendencies in a perfect equipoise, were the corollaries of such a conception. This method had the heuristic advantage of guiding and controlling investigation into fields hitherto left uncultured.

tivated; it had the serious fault of over-simplifying the phenomena studied, of abandoning history and careful observation for theories pushed to extremes irreconcilable with the facts. The postulate that all societies at all times are governed by the same forces, that human actions can be reduced to simple formulas analogous to those of physics, is clearly expressed by Sir William Temple in the Preface to his *Observations on the United Provinces* (1672):

I believe it will be found at one time or other by all who try, that whilst human nature continues what it is, the same orders in state, the same discipline in armies, the same reverence for things sacred, and respect of civil institutions, the same virtues and dispositions of princes and magistrates, derived by interest, or imitation, into the customs and humors of the peoples, will ever have the same effects upon the strength and greatness of all governments, and upon the honor and authority of those that rule, as well as the happiness and safety of those that obey.

Under this conception the idea of natural law took on a new meaning. Locke spoke of a "law antecedent and paramount to all positive laws of men." John Wise thought that the rules of government were drawn up by "a wise and provident nature, and by the dictates of right reason." Montesquieu professed to draw his "principles not from prejudices but from the nature of things." Bolingbroke derived nationality and government from the universal laws of reason. The method was carried to its extreme, not to say reduced to absurdity, by Rousseau when, with engaging frankness, he expounded his axioms in the preface to his *Discourse on Inequality*. Recognizing that "the most useful and the least advanced of all sciences is that of man," he complains that this science cannot be studied experimentally because it would take the greatest philosophers to think up the proper experiments and the greatest monarchs to carry them out. Happily, however, he continues, such experiments are not necessary, for the truth may be won by deductive reasoning from first premises. Astronomers, though unable to study the past history of the solar system, deduce it from known

forces acting now. Thus the political student may deduce past history from the action of processes now at work. Even if his history is incorrect, Rousseau continues, his reasoning is bound to uncover truth. Perhaps the state of nature never existed: no matter, the hypothesis of its existence leads to valuable results. He then concludes:

Let us then begin by getting rid of facts, for they do not touch our question. It is not necessary to take the researches by which one may study this subject [of social inequality] for historical truths; one need only take them as conditional hypotheses, more fit to explain the nature of things than to show their true origin, and similar to the hypotheses now daily made by our scientists on the formation of the world.

The reader of this passage is struck less by the exaggerated confidence of Rousseau in his own principles than by his misconception of science. True science is dependent on observation and accumulation of facts. Pure reasoning can never supply the want of careful examination. But this just criticism of a bad method does not detract from the historical importance of the idea of science applied to society. In fact, the name "political science" first attained currency in the eighteenth century. It was first used, as far as I have noticed, in a letter of Leibniz to Bishop Burnet in 1701.¹ A little later Jonathan Swift, in *Gulliver's Travels*, ironically commented on the Brobdingnagians' failure to "reduce politics to a science, as the more acute wits of Europe have done." A little later David Hume said that "politics may be reduced to a science"; and after him the thought became common and the phrase frequent.

It must not be imagined, however, that the method of observation and comparison was wholly neglected by the better writers of the Enlightenment, or even by Rousseau himself. Locke and Montesquieu carefully studied past history, present governments, and anthropology, in order to build a sound basis for their politics. The history of Rome, the working of the English constitution, the fundamental laws

¹ Leibniz: *Correspondenz mit der Kurfürstin Sophie*, ii, 267.

of the American colonies, and the social arrangements of the darker races from China to Peru were all studied by Locke, by Montesquieu, and by others, with the purpose of extracting from them sound rules for the interpretation of political phenomena.

Next to science, democracy has been the most general of all the forces moulding modern culture. Naturally, it had peculiar importance for that branch of thought concerned with public institutions. The causes of the growing power of the third estate were purely economic. There is no discernible connection between the rise of democratic theory and the contemporary expansion of free-thought. Hobbes, the most radical of the free-thinkers, championed despotism; Locke, the orthodox Christian, defended the Whig revolution; and Rousseau, the mild Deist, preached equality. But, whether conservative or progressive, all thinkers of that age found themselves obliged to deal with the new social equilibrium caused by the increasing claims of the middle class. These claims were, indeed, as yet far from being satisfied, except in America. The course of revolution develops in three stages. First, some important invention alters the economic and social equipoise by bringing wealth and knowledge to a new class and thus depressing the older privileged classes. Then follows a period of increasing self-consciousness of the members of the new class, of an intellectual remodeling of previous values and of an assertion of new rights. Finally comes the political change that brings institutions into harmony with the existing conditions. The Enlightenment coincided with the second of these stages. The commercial revolution of the sixteenth century had elevated the merchant class and undermined the position of the nobility and clergy. Then came the thinkers of the Enlightenment to justify the pretensions of the newly self-conscious middle and moneyed classes. Finally, in the late eighteenth and early nineteenth centuries came the political revolutions that put the bourgeoisie in power.

What we really observe, then, in the thought of the age, is a new climate unfavorable to the pretensions of priests,

nobles, and even kings, but kindly towards the great body of the people. It came to be believed that the middle class is the most virtuous, happy, and valuable element in the state. So Hume stated in an essay devoted to a comparison of the various classes.² The Harlowes and Grandisons and Westerns and Joneses who filled the pages of the popular novels usually belonged to the smaller gentry or to the bourgeoisie. Robinson Crusoe gloried in the mediocrity of his birth:

Mine was the middle state [he tells us], or what might be called the upper station of low life which . . . is the best state in the world, the most suited to human happiness, not exposed to the miseries and hardships, the labor and sufferings of the mechanic part of mankind, and not embarrassed with the pride, luxury, ambition, and envy of the upper part of mankind.

As the middle and lower classes rose in the public—that is, in their own—estimation, the privileges of the higher classes began to be questioned and attacked. In 1723 Marivaux wrote a comedy called *The Isle of Slaves*, with a plot resembling that of Barrie's *Admirable Crichton*. In it he depicts the effects of a shipwreck in turning social arrangements upside down; for, when a company is cast on a desert island, the former masters prove themselves incapable while the former servants take the leading positions in the new state.

Even the divinity of monarchs began to be questioned. "The right divine of kings to govern wrong" appeared to Pope and his readers a doctrine fit to be taught only by Dullness.

I foresee [wrote Chesterfield in 1752] that before the end of this century, the trade of both king and priest will not be half so good a one as it has been. Du Clos, in his reflections, hath observed, and very truly, qu'il y a un germe de raison qui commence à se développer en France! A *développement* that must prove fatal to regal and papal pretensions.

² Hume: *Essays*, ii, 376 (1742). "Upon the Middle Station in Life."

Perhaps the number of disputed royal titles—in England, in Spain, and in Poland—had something to do with the decline in the worship of the crown. In England, especially, the dependence of the reigning dynasty on the support of the country party, and the alienation from the crown of the Jacobite Tories, put the supporters of divine right in an awkward position.

However this may be, it is certain that the publicists of the eighteenth century began to feel more sympathy with doctrines of popular sovereignty. In order to justify such doctrines they widely accepted the myth of a primitive Germanic freedom, found, or imagined, in Tacitus, in the medieval chroniclers, and in the ancient charters of liberty. This myth, originating among the humanists and developed by the Puritans and monarchomachs, was eagerly seized by the historians and political thinkers of the Enlightenment, reaching its culmination in Montesquieu. It is an important evidence that the mind of the age was not wholly absorbed in natural science but that it found the need of historical justification for its theories.

2. THE ENGLISH REVOLUTION

If certain general tendencies marked the political thought of all countries, a considerable variety of opinions met the different needs and actual problems of each several nation. In England the whole course of political thought depended on the establishment and development of the principles of the revolution of 1688-89. The despotism and religion of James II led to a conflict between king and Parliament, culminating in the flight of the monarch in December, 1688. The next month the Convention Parliament assembled and declared:

That King James II, having endeavored to subvert the constitution of the kingdom by breaking the original contract between king and people, and by the advice of Jesuits and other wicked persons having violated the fundamental laws, and having with-

drawn himself out of the kingdom, has abdicated the government; and the throne is vacant.

The crown was then offered to William and Mary; laws were passed to determine the right of succession and to limit it to Protestants, and to insure the liberties of the subject and the rights of Parliament to legislate, to levy taxes, and to discipline the army. But the Whigs, while depriving the king of his mysterious and superstitious attributes and while granting him office on the same tenure as that of other magistrates, had no intention of reducing him to a cipher. The accession of a German dynasty early in the eighteenth century almost accidentally led to a further decline in the royal power. George I, unable to understand the debates of his ministers, ceased to attend cabinet meetings. Henceforth the cabinet and not the king executed the laws; and the cabinet held office only during the pleasure of the House of Commons.

The Parliament, thus made supreme, represented not the people at large, but the nobles, the landed gentry, and the rich industrial and commercial plutocrats. While despising the common people as unfit to rule and dreading them as dangerous to their privileges, they vaunted their own liberty. Their sentiments were those expressed and acclaimed by Addison's *Cato*:

But what is life?

'Tis not to stalk about and draw fresh air
From time to time, or gaze upon the sun:

'Tis to be free. When liberty is gone,
Life grows insipid and has lost its relish.

Educated by such glorifications of liberty, and by Swift's declaration that "all government without the consent of the governed is the very definition of slavery," the unenfranchised classes began to chafe under their yoke. Beginning in 1769 they made serious attempts to reform Parliament by enlarging the franchise. In this year popular meetings began to express public opinion; soon they became a reg-

ular and important organ of English political life. For more than sixty years, however, these efforts failed to accomplish anything, chiefly because of the terror with which the American and French revolutions inspired the possessing classes.

In the meantime the need for a theoretical justification of the revolution of 1689 was so well supplied by John Locke that for seventy years, until superseded by Rousseau, he remained the outstanding exponent of political liberalism. His frankly expressed purpose "to establish the throne of our great restorer, our present King William . . . and to justify to the world the people of England," obliged him to assert the right of revolution and the sovereignty of the people. The task was extremely congenial to him by reason of his Puritan extraction, his association with the Whig leaders, and his persecution by the Stuarts. In the very year of the Revolution he published the two *Treatises on Government* that constituted the scientific defense of its principles.

With philosophic thoroughness he began by examining the origin of political authority. He adopted the theory of Hobbes that men had once lived in a state of natural liberty and equality, ruled by the law of reason, and enforcing that law only by the self-help of every man. In order to enjoy protection of life and property, men then made a social contract giving up to the government the right of determining and punishing offences against the laws of nature. In doing this men did not give up their natural rights, but retained a natural liberty "to be under no legislative power but that established by consent in the commonwealth."

"The great end of men's entering into society is the enjoyment of their properties in peace and safety." In these words Locke betrays the concern of the possessing class in modern times for the protection of the wealth upon which privilege and command of comfort and of luxury depends. Earlier ages esteemed the protection of religion or of monarchy or of feudal rights the main purpose of government; the modern finds its chief purpose to be the protection of

property. Locke is therefore careful to assert a moral justification for private ownership. Whereas he admits that the earth and its fruits were originally free to all, he asserts a moral right to property in the product of labor. As practically all wealth originates in labor, this justifies every man in his title to lawfully acquired wealth. Even land, in Locke's theory, owes its productivity almost entirely to labor: an acre of wheat in England yields £5 per annum; an acre of the American wilderness yields hardly anything; and the difference is ascribed to the difference in the amount of labor put on each.

For securing the benefits of civil society Locke argues that three organs of government are necessary: a legislative to define crimes against the law of nature; a judicial to apply this ruling impartially to individuals; and an executive to give the judgments force. In order to insure the liberty of the subject Locke formulated the famous doctrine of the separation of the three powers, or at least of the legislative and executive.

In case of conflict, however, the legislature must be supreme because it represents most directly the sovereign people. If the representatives of the people, too, should betray their constituents, they should be overthrown by direct action. Though no machinery is provided to make effective the right of the people to revolt, Locke thinks that "an appeal to Heaven"—that is, to arms—will be justified and will be likely to be effective.

Such, in bare outline, is the doctrine that soon became the gospel of the American and English liberals and the starting-point of much French theory. In the main it expressed the aspirations of the middle class, limiting kings while at the same time avoiding the dangers of "a numerous democracy." To some extent, this doctrine became a subject of party controversy. The most distinguished English critic of the gospel of Locke saw plainly that each party, Whig and Tory, sought in an appeal to a transcendental sanction a justification of its own platform. The

surprisingly acute remarks of Hume on the rationalization of political desires are worth quoting:⁸

As no party, in the present age, can well support itself without a philosophical or speculative system of principles, annexed to its political or practical one, we accordingly find that each of the factions into which the nation is divided, has reared up a fabric of the former kind in order to protect and cover that scheme of actions which it pursues. . . . The one party, by tracing up government to the Deity, endeavor to render it so sacred and inviolate, that it must be little less than sacrilege, however tyrannical it may become, to touch or invade it in the smallest article. The other party, by founding government altogether on the consent of the people, suppose that there is a kind of original contract, by which the subjects have tacitly reserved the power of resistance to their sovereign, whenever they find themselves aggrieved by that authority with which they have, for certain purposes, voluntarily entrusted him.

A Tory himself, Hume made an annihilating attack on the whole doctrine of the social contract as an explanation and justification of government. Assailing the doctrine as both unhistorical and as unphilosophical, he asserted that such a contract as assumed by Locke would be beyond the comprehension of the savages supposed to have made it, and that history and present observation show that obedience is merely a custom or habit. As far as men reason on their obligations to society, they apprehend their advantages from stable government and yield obedience either to force or to the consideration that general disobedience will disrupt the state.

While philosophers were debating the origin of society and the nature of sovereignty, statesmen were tearing down old customs and building up new practices, and a host of able pamphleteers and newspapers were educating, inflaming, and debauching the public with a variety of arguments generally appealing to the loftiest principles and generally meant to serve the baser ends of avarice and ambition.

⁸ D. Hume: *Essays*, ed. by Green and Grose, i, 443; Essay 12: "On the Original Contract." 1752.

Little did Harley care for divine right or Sir Robert Walpole for the social contract as long as each of them, as minister, could buy enough votes in the House of Commons to keep himself in power and enough journalists in the city to keep him in popularity. In the speeches of these statesmen and in the writings of these journalists—among them such able pamphleteers as Jonathan Swift and Daniel Defoe—little valuable political thought can be found.

Almost the only one of the leading statesmen of the day to attempt to frame a whole theory of government and of history to justify his own public acts was Henry St. John, Viscount Bolingbroke (1678-1751). An education begun at Eton and completed by the grand tour of France and Italy gave him a sound knowledge of Latin, French, and Italian, and a wonderful mastery of English rhetoric. His acquaintance with men of pleasure and of fashion and his reading in modern authors relieved him of all religious and moral scruples. Ambitious, able, and unembarrassed by ethical prejudices, he began his political career so brilliantly as to be appointed minister of war at the age of twenty-four, and ended it damned as a traitor and renegade by both parties at the age of thirty-eight. He spent his later years writing a series of works on religion and politics intended to justify his own career, works enormously admired in their own age for their style and generally neglected by posterity for their shallowness. From the political essays, however, emerge the ideas that party government is evil, that a patriot king should be above parties, and that the form of government is immaterial provided that it is agreeable to the spirit of the nation governed, and is well administered.

This last idea was taken over by Bolingbroke's friend Alexander Pope and put into the much quoted couplet:

For forms of government let fools contest;
Whate'er is best administered is best.

This couplet occurs in the Fourth Epistle of the *Essay on Man*, an epistle devoted to "The Nature and State of Man with respect to Society." In this poem (1733) Pope

sketches the origins of society in the natural state, the birth of civilization by men's learning from birds and beasts, the beginnings of government in the patriarchal state. These ideas, not fresh with the author, further spread abroad the doctrines of Hobbes, Bacon, and Locke not only among the English public but on the European and American continents.

3. AMERICAN REPUBLICANISM

Less by Locke and Grotius, popular though they were in America, less by assiduously studied law books than by their own unique experience and situation were the peoples of the British colonies west of the Atlantic educated in the theory and practice of popular government. Happily neglected, or at least little oppressed by the British rule, lacking the materials for a court and for a hereditary nobility, the colonies rapidly developed a form of government more broadly popular than that of any of the great European states. Their polity was, indeed, far from democratic, in that their societies contained large numbers of slaves and of unenfranchised free men; but it was in all cases a government in which the popular element predominated. The vestries of the churches and the town meetings furnished practical lessons in self-government. So, to a large extent, did the provincial constitutions. Of the thirteen colonies later to become the United States, eight were royal provinces ruled by a governor appointed by the British crown, and by elective legislatures; three were ruled under royal charter by proprietors and by representative legislatures; and two were purely popular, framing their own fundamental laws and electing their executive officers as well as their legislative assemblies.

All of these frames of government were worked by parties. The opposition of the interests of executive and legislature led to the same alignment of Whig and Tory as in England. As the colonies grew stronger they began to refuse to recognize the supremacy of the British Parliament

and developed a theory of allegiance to the Crown only, with their own Assemblies as legislatures of equal authority, in their own provinces, to that of the Parliaments of Westminster and of Dublin.

Until the conflict with the mother country came to a head in the Revolution, America produced only one great political thinker, or at most two. Franklin's advanced democratic theory, favoring unrestricted manhood suffrage, single-chamber legislatures, and annual sessions of the provincial assemblies, doubtless had much influence, though expressed in unsystematic form.

Much more ordered and symmetrical were the political writings of John Wise (c. 1652-1725) the most brilliant pamphleteer of the colonies. After graduating from Harvard he spent an uneventful life as Congregational minister at Ipswich, Massachusetts, where his pretty parsonage is still visited by a grateful posterity, or at least hastily glimpsed from swiftly passing motor cars. His political pamphlets were called forth in the course of a controversy on church government started by the Mathers in an anonymous manifesto published in 1705 under the title *Questions and Answers*. Under this harmless caption the two theocrats of Boston Puritanism proposed an insidious scheme to take away the government of the churches from the laity and to give it to the clergy alone. This attack on the prevailing democratic polity of the Congregational church provoked Wise, though a clergyman, to defend the popular and lay side of the argument in two pamphlets entitled *The Churches' Quarrel Espoused* (1710) and *A Vindication of the Government of the New England Churches* (1717). In the course of his argument he was led to examine the principles of government in general and to give the democratic form the most brilliant apology it had yet received from any writer. With much breadth of thought, glow of style, racy humor, and impassioned earnestness he argued that democracy is the most ancient and the most natural form of polity:

Nature having set all men upon a level and made them equals, no servitude or subjection can be conceived without inequality, and this cannot be made without usurpation in others. . . . The original civil power is the people.

"By natural right," he continued, "all men are born free"; and again: "The end of all government is to promote the happiness of all, and the good of every man in all his rights, his life, liberty, estate, and honor." Consequently, "A democracy in church or state is a very honorable and regular form of government according to the dictates of right reason."

Though Wise but advanced the principles later adopted by the Revolutionists, it is doubtful whether his writings exerted much direct influence even in New England. Still less were they known in Europe. What did impress the more thoughtful and the more open minds of Europe was the growth of new states that seemed to exemplify many of the current theories of government and to serve as laboratories for political experiment impracticable elsewhere. The more popular view of America, until the Revolution, oscillated between idealizing it as a land of liberty and of plenty and despising it as a penal colony. The leaders of American thought, naturally, preferred the former alternative, and were convinced, as Jonathan Edwards put it, that Providence intended their land as "the glorious renovator of the world." Many of the immigrants, too, were drawn to the country in the hope of more wealth and more liberty than they enjoyed at home. On the other hand, Virginia figures in Defoe's novel *Moll Flanders* as a land inhabited chiefly by indentured servants and transported felons. Both views are represented in L'Abbé Prévost's famous romance *Manon Lescaut*. The hero and heroine of this book emigrate to New Orleans expecting to find "a land of milk and honey, the abode of contentment and delight," instead of which they meet hardship and death in the forests.

If the immigrant was sometimes dismayed by the rough life of a new country, the political philosopher, particularly

in France, saw much to admire in the free institutions of a simple society. Pennsylvania, because of the European renown of its founder and of its great citizen, Franklin, attracted wide attention and won so much admiration that, on the eve of the Revolution, it took the place of England, in the thought of Europe, as the ideal government. In one of his *Letters on the English* (1734) Voltaire introduced the Quakers, Penn, and Pennsylvania to the French public with a eulogy that was repeated and enhanced in later works. Montesquieu compared Penn to Lycurgus. The English editor of John Bartram's *Observations*⁴ thus described the colony in 1751:

Pennsylvania, founded on the principles of moderation (the first of all political virtues) and every way famed for the wisdom and lenity of its government, is become the admiration of those who compare it with anything related in history, and the well-known refuge of the oppressed and persecuted, who cheerfully abandon their native soil to purchase the inestimable blessings of liberty and peace.

A few years later a Russian traveler gave an even more glowing account of the colony:⁵

Examine this flourishing province in whatever light you will, the eyes as well as the mind of the European traveler are equally delighted because a diffusive happiness appears in every part, happiness established on a broad basis. The wisdom of Lycurgus and Solon never conferred on man one-half the blessings and the uninterrupted prosperity which the Pennsylvanians now possess: the name of Penn, that simple but illustrious citizen, does more honor to the English nation than do those of many of their kings.

Finally, G. T. F. Raynal, in his *History of European Colonies and Commerce* (1770) added this high tribute:⁶

⁴ Anonymous editor in a preface to the 1751 edition, iv.

⁵ *Memorials of John Bartram*, 45. Letter of Iwan Alexiowitz describing a visit to Pennsylvania in 1769.

⁶ G. T. F. Raynal: *L'Histoire philosophique et politique des établissements et du commerce des Européens dans les deux Indes*, 4 vols., 1770, quoted by E. Phillips in *American Historical Review*, xxxvi, 6 (1930).

The humanity of Penn was not limited to the savages. It extended to all those who came to live under his government. As the happiness of man was here to depend on legislation, he founded his on the two pivots which make the splendor of states and the felicity of citizens: property and liberty. If I may borrow the language of the fable in speaking of facts which seem fabulous, I would say that Astræa, so long returned to the heavens, had come back to earth and that the reign of innocence and concord was about to be reëstablished among men. Here the writer and his reader can breathe and recover from the disgust that modern history and especially the establishments of other Europeans in the New World have caused him.

4. THE FRENCH "PHILOSOPHES"

The picture of a golden age in America was painted largely to satisfy the yearnings for freedom and equality felt by men oppressed by tyranny and privilege. The dream of happiness and justice in some foreign society, either in Tahiti or in China or in Pennsylvania or in England was the wish-fulfillment of the unsatisfied desires of the French people. Until about 1685 the despotism of Louis XIV had disguised its grim harshness under the crown of military glory and in the rich robes of art, poetry, and eloquence. But the persecution of the Huguenot, the defeat of the army, and the intolerable demands of the tax-gatherer, brought home to the people the sad fact that they were neither respected abroad nor happy at home. Adversity always turns men against their government; and such hardship and humiliation as the French now felt produced a bitterness of disillusion scarcely conceivable now. No wonder that they turned with longing to other and happier lands. No wonder that they saw Eden in the Pacific and Sparta in America. No wonder that they turned to free and victorious England for lessons in the art of government. "It is inconceivable," wrote the British ambassador at Paris in 1715, "how they detest their condition here and rave about ours."

Naturally, among the first to attack the Bourbon despot-

ism were the Huguenot refugees. Pierre Jurieu (1637-1713), an exiled pastor, carried on a relentless war with the enemies of his religion. He hurled refutations at Bossuet and invectives at Louis; he consoled the faithful in France, and defended them abroad. Animated by religious patriotism, he turned spy and sold French military and naval secrets to the British government. It was perhaps he, perhaps Michel Levassor or some other Huguenot, who published in 1689 *The Sighs of Enslaved France*, charging that "Louis has exalted himself over the ruins of all classes in the state, as if he could be great by destroying the subjects on whom his grandeur is founded."

Not only exiled Protestants but Catholics enjoying high office at home soon found a voice to protest against the unjust wars and savage tyranny that was grinding the whole people between two millstones. Among the first to do so was François de Salignac de la Mothe Fénelon (1651-1715) the mystic and quietist, the writer of devotional tracts and of didactic romances, the son of a nobleman and the archbishop of Cambrai. With great courage he penned an *Examination of Conscience on the duties of Royalty* so bold that its authenticity was doubted until the autograph was found. This work, dating from about 1692, was followed by the *Télémaque* (1699), painting the picture of a good king and of a perfect constitution, and by pamphlets denouncing the War of the Spanish Succession as unjust, and proposing drastic reforms in the government. Charging that a conqueror is no better than a highwayman, and that Louis's despotism had subverted the rights and ruined the prosperity of France, Fénelon demanded the revival of the ancient constitution, and the erection of a hierarchy of legislative assemblies, representing the provinces and the nation, as a restraint on arbitrary power.

The indignation that had furnished the mainspring of political criticism in France in the first years of the eighteenth century had sufficiently cooled after a generation to allow a calm and judicial estimate of social phenomena. The milder government and greater prosperity enjoyed un-

der Louis XV permitted, and the rise of the scientific spirit in the treatment of society evoked, one of the most thoughtful and exhaustive treatises ever produced by a political philosopher. *The Spirit of the Laws* was so thoroughly prepared by long study and varied experience as to take its place at once among the classics of its kind.

Charles Louis de Secondat, Baron de Brède et de Montesquieu (1689-1755) was born near Bordeaux, studied law, inherited from an uncle his barony and a magisterial office in the Parlement of Guyenne in 1716. He read much, studied physical science on which he wrote several papers, was elected a member of the Academy of Bordeaux, learned much of human nature as a magistrate and more by foreign travel. Ambitious of fame, he dabbled not only in science but in elegant literature. The name of the gravest political philosopher of the century first flashed upon the public as that of the author of a flippant, scandalous, indecent and irreverent romance. *The Persian Letters* (1721) tell the story of the journey of an oriental to Europe, and incidentally the intrigues of the eunuchs and odalisques left in his harem. The kernel of it all, however, is a keen satire on the religion and government of the French people. The unabashed ridicule of the king who has a mistress of sixty years and a minister of twenty, of the pope as "an old idol," of the inquisitors as "a cheery species of dervishes" fond of murdering people for obscure trifles, for the first time since Rabelais brought home to the delighted public the joy of ridiculing their oppressors.

Very different was the second great work of the author, *Considerations of the Causes of the Greatness and of the Decadence of the Romans* (1734). This study, though based on a profound reading of Roman history and though carefully polished as to style, disappointed the public, gaping for more erotic spice, and made them speculate on "the causes of the decadence of M. de Montesquieu."

This joke lost its point when the author published, in 1748, his long prepared treatise on *The Spirit of the Laws*, written with so much thought and learning as to make it the

text-book of statesmen and with so much wit and charm as to recommend it to the *salons*. The purpose of the work is indicated in the subtitle: "the relation that laws ought to have with the constitution of each government, with manners, climate, religion, commerce, &c." It was a grandiose effort to subject to scientific treatment the whole field of social and political phenomena. The author's reading in history and politics was very wide. Perhaps Bodin's book *On the State*⁷ served as a model. But what distinguished Montesquieu was not his study of the classical theorists, but his effort to gather fresh material in an examination of the living societies of his own day. From China to Pennsylvania, from Russia to Africa, from the coarseness of the rudest barbarism to the most refined and subtle civilization, he gathered and placed in review all the constitutions that had ever prevailed among mankind, weighing, measuring, comparing and collating them all, joining fact with theory and applying to the gathered materials the test of the speculations of the most profound theorists. The charge against him that he accepted his facts uncritically, or bent them to suit his theories, that, "if nothing established by authentic testimony can be racked or chipped to suit his Procrustean hypothesis, he puts up some monstrous fable about Siam, or Bantam, or Japan, told by writers compared with whom Lucian and Gulliver were veracious,"⁸ is unjust. A careful study of his use of sources for China shows that he used the best authorities available and that he read them critically, without blind credulity.⁹ That he was occasionally deceived, that he now and then interpreted facts to suit his theories rather than remodel his theories to suit the facts, but proves his human fallibility.

Though his main purpose was scientific, he would not have been a man, or even a *philosophe*, had he not looked to his researches for lessons applicable to his own country.

⁷ *Six Livres de la République*, 1566.

⁸ Macaulay: *Essay on Machiavelli* (1827).

⁹ E. Carcassonne, in *Revue d'Histoire littéraire de la France*, xxxi, 193 ff. (1924).

Like many contemporary Frenchmen he found in the English constitution the model for reform. Visiting England in 1729-30 he examined the workings of the government both in current practice and in history. He studied and correctly understood the Revolutionary settlement of 1689; but he failed to grasp the subsequent growth of government by a cabinet responsible to the House of Commons. In England the theory and practice of the constitution often diverge, the ancient form being kept long after a new content has been poured into it. Hence, Montesquieu believed that the executive and legislative were independent and equal authorities, and founded on this obsolete view his famous theory of the separation of powers as the key to liberty, a theory taken over from him by Blackstone and the English bar, and by the framers of the American Constitution.

In one other respect Montesquieu accepted and gave authority to a myth about the British polity. "This beautiful system of government," he avers, "was discovered in the forests of the ancient Germans, as one can see by reading Tacitus." It was the old and widely accepted legend of the antiquity of English freedom, a legend recently given great precision in Rapin Thoyras's *Histoire d'Angleterre* (1723) from whom Montesquieu took it. Voltaire's note on the passage just quoted reveals a keener criticism:

Is it possible that the House of Lords, the House of Commons, the courts of equity and of admiralty come from the Black Forest? One might as well say that the sermons of Tillotson and Smalridge were formerly composed by the Teutonic sorceresses who judged the success of war by the way in which flowed the blood of the prisoners they immolated. May not one find the origins of the English cloth manufacture in the woods where the Germans preferred to live by robbing you than by working, as Tacitus says?

With these few errors, Montesquieu produced a remarkable work inspired by the scientific principle that human nature is a constant, varying in ascertainable ways in response to environmental and cultural influences. He defines law

as "the necessary relation springing out of the nature of things," that is, he regarded it as logical and not as arbitrary. Laws and governments are natural if they correspond to the character of the people; and this character is determined chiefly by climate and geography. He classifies governments as monarchies of which the principle is honor; republics, of which the principle is virtue, or patriotism; and despotisms, of which the principle is fear. The institutions of each form are moulded by its principle. Changes of government follow social changes. Republics decay when the feeling of equality disappears.

Liberty Montesquieu defines as the belief that one is acting as he wishes to act. Liberty is therefore conditioned upon law, that is, upon limitation of the powers of government. As liberty is essential to happiness, Montesquieu pleads for it, as well as for a humane administration of the criminal laws.

His theory of climate, for which he might have got the suggestion from Bodin, tries to show that all institutions are shaped by physical environment. Liberty is found in cold countries because the people are energetic; despotism and slavery are congenial to hot countries because the people are lazy. Even religions are adapted to climate. The Christian religion is suitable to cold zones and to moderate governments because of its spirit of virtue and equality; Mohammedanism flourishes in hot countries because it allows polygamy and slavery. In Europe the northern countries adopted Protestantism because it suited the independent spirit of the people; the southern nations had clung to Catholicism because they found in it a sensuous and easy cult. Even the different fortunes of Lutheranism and Calvinism are referred by the author to their different characters, the one adapted to benevolent despotism, the other to republicanism.

In startling contrast to the moderation, rationalism, and urbane distinction of Montesquieu stand the passion, turbulence, and proletarian affections of Rousseau. The one began as a romancer to end as a political philosopher; the

other began as a political theorist to end as a popular novelist. The one as an aristocrat appealed to the rulers; the other as a democrat aroused the masses. The one based his conclusions on a universal survey of the world; the other deduced his doctrine from premises supplied by introspection of his own mind. The one was the father of constitutions; the other of revolutions. The one wrote with calm and humorous detachment; the other was convulsed with passion.

Jean Jacques Rousseau (1712-78) was born at Geneva. His first account of his boyhood, written when he was only nineteen, reveals much of his character and training:¹⁰

Son of a watchmaker, I was brought up to become an artisan myself. When I was bound as an apprentice my taste for reading and the subtlety of my mind alienated my brutal master, who nagged me, humiliated me, and gave me nothing but bad treatment. On Sundays I walked abroad with young people of my own age . . . and we enjoyed sweet liberty.

Severe punishment for failing to return on time from one of these walks caused the boy to run away; and thenceforth he lived the life of a vagabond, for many years poor and despised, making a precarious living by copying music or else sponging on the women with whom he formed unions. He wandered first to Savoy and then to Italy. In Venice, in 1744, he began to study politics, and thought that he discovered that the institutions, morals, and happiness of a people depend wholly upon its form of government. Then he went to Paris, and again underwent experiences of neglect and contempt that left a deep wound on his mind. Never was there a more painful "inferiority complex" than his. He came to believe that he was persecuted and betrayed by all his friends; but chiefly he charged his woes to the wrong constitution of society. Snobbery, incivility, inequality, and injustice crushed down his aspiring talents; his good impulses were thwarted and perverted by the existing social arrangements.

¹⁰ Letter of 1731; *Correspondance générale de Rousseau*, i, 4.

This idea, long germinating in a half diseased mind, burst into sudden bloom one day in 1749 when he was walking from Paris to Vincennes. Then he saw a vision¹¹ which he described as "a sudden inspiration, dazzling the spirit with ten thousand lights." It was revealed to him in a flash that "man is naturally good, and that it is by our own institutions alone that men become wicked." From this myth flowed the whole not only of Rousseau's doctrines in politics, economics, ethics, religion, and esthetics, but a great part of the romanticism and revolution of the coming age.

Presently he found an opportunity to expound his views in an essay offered in competition for a prize on the effect of the arts and sciences. His *Discourse on the Arts and Sciences* which won the prize and made him famous, sustained the thesis that civilization had corrupted, not improved, the lot of mankind. Four years later (1754) he greatly increased his popularity with the public by a *Discourse on Inequality*. To his mind the prime injustice society inflicted on men was the inequality that made some privileged and some common, some rich and some poor. Born in the Republic of Geneva, he looked upon it as the best government then existing. "I am a republican," he wrote Voltaire, "I adore liberty. I detest equally domination and servitude." The human race, he observed, is composed of the common people; if all the kings and all the philosophers were removed from it, so little would be taken away that one would notice no difference. And yet, kings and philosophers have conspired to take away the liberties and happiness of the masses. It was not always so; it could not have been so. Once there was a state of nature in which men had lived simply, virtuously, happily, and on terms of perfect equality. This was the savage society that one might think of as almost primitive, and that one could see, perhaps, among the Indian tribes. Rousseau projected his idealization of the natural man to America and Africa; but he really found him in his own heart. *He* was the noble

¹¹ *Correspondance générale*, vii, 50 f.

savage—noble in his own opinion and savage in the opinion of those who tried vainly to befriend him.

Such were the postulates assumed in his *Discourse on Inequality*. All men, he begins, are inspired by two sentiments, the one of self-preservation, the other of sympathy with their fellows. There are two sorts of inequality, physical, which is natural, and political, which is so unnatural as to bring it about that the weak often rule the strong. The cause of this second, artificial inequality is the existence of property:

The first man who, after enclosing a piece of ground, bethought himself to say "this is mine," and found people simple enough to believe him, was the real founder of civil society. From this first successful usurpation of the common earth flowed wars, crimes, misery, and horrors.

From it also flowed the progress of the arts and sciences, for the appropriation of the land as private property had been followed naturally by its cultivation and hence by the invention of the arts of agriculture and metallurgy. Civilization is therefore the mother of luxury and luxury is the mother of vice. The whole theory is a new version of the fall of man by eating the fruit of the tree of knowledge. In this Calvinistic doctrine Rousseau had been bred.

Having diagnosed the social malady in the *Discourse on Inequality*, Rousseau proceeded to prescribe the remedy in a work on *The Social Contract* (1762).

Man is born free [he begins] and everywhere he is in chains. He who believes himself the master of the rest is only more of a slave than are they. How does that change from freedom to slavery come about? I do not know. What can render it legitimate? That question I think I can answer.

It is done by the social compact. Authority has no rational basis except in consent. The problem therefore is

to find that form of association which defends and protects with all the common force the person and belongings of each member,

and by which each one, uniting with all, yet obeys no one but himself, and remains as free as before.

Sovereignty, therefore, abides in the whole community and is expressed by the general will as seen in legislation:

The general will is always upright and always intends the public good; but the deliberations of the people do not always have the same rightness. One always wills his good, but does not always see it. The people can never be corrupted, but can often be fooled; and it is only then that it appears to wish what is evil.

From this thesis Rousseau draws the conclusion that the mark of a legitimate government is rule by law, not by caprice. Classifying governments in the usual three categories, he regards all that are legitimate as republics, whatever their form. He prefers democracy in such small states that all the people can participate in legislation directly, for he thinks that history has shown "that soldiers enslave their country and representatives sell it." The excellence of a government he thinks can be measured by the growth of population and by its even distribution throughout the land. A declining population and the concentration of people in large cities at the expense of the rural districts both indicate the presence of social disease. Small states, he adds, are naturally democracies, middle-sized states aristocracies, and large states monarchies.

The gospel according to Jean Jacques is nothing but the rationalization of the longing for liberty felt by the peoples of Europe and especially of France. His mythical history, his imaginary savage utopia, his faulty logic, did not prevent his teachings from obtaining an enormous influence with the people whose convictions, secret needs, aspirations, hatreds, and prejudices they so perfectly expressed. In politics no less than in religion the heart has reasons that the reason knows not of. Men sick with oppression and poverty and despair hailed Rousseau, the enemy of kings, the scorner of nobles, the lover of the lowly, the prophet of

imminent revolution, as their champion and defender. And the governments, taking alarm, suppressed his books and exiled his person in the vain endeavor to check the spread of his ideas. For they did spread like wildfire. If he invented little he made articulate the dumb longings of the masses; he fired them with enthusiasm, and with hatred, and with sedition.

Very different was the reception of Rousseau's gospel in the various countries. The doctrine which produced the Revolution in France, produced *The Sorrows of Werther* in Germany and *Sandford and Merton* (a smug pedagogical story) in England. America, already free and happy, rejected Jean Jacques and harked back to Locke and Montesquieu. Scotland, in the persons of Hume and Boswell, befriended him. England, attracted by the romanticism and by the pedagogy of Rousseau, was repelled by his doctrine of liberty. The first indication I have discovered that Rousseau's political theory was studied, though even then rejected, in England, is found in Burke's *Vindication of Natural Society* (1756). This tract was intended as a satire on Bolingbroke's attack on revealed, and vindication of natural, religion. Burke intended to show that similar arguments to those used by Bolingbroke against religion could be turned against civil society. This in his opinion would be their *reductio ad absurdum*. But his arguments that civilization had produced evils and that natural society only is happy, are so closely modeled on the *Discourse on Inequality*, which had appeared the previous year, as to prove that the English statesman had carefully studied it.

The German mind, inclined to speculation on other subjects than politics, eagerly absorbed Rousseau's romanticism without much of his revolutionary ferment. In Italy Jean Jacques found many followers, though he was denounced by the arbiters of opinion as "an eloquent misanthrope," and his *Social Contract* as a "marvelous mixture of true and false conclusions."¹²

¹² These judgments given in a journal called *Novelle letterarie* 1759-62, cited by Natali: *Il Settecento*, 1929, i, 43.

So much thought was given to social and political questions by the leaders of the French Enlightenment that the word "philosophe" came to mean, in a special sense, "one who applies himself to the study of society with the purpose of making his kind better and happier."¹³ The political theory of most of the men known by this appellation was a cautious compromise, shunning the practical conclusions of principles that proved more subversive than was intended. It is remarkable that even Rousseau was more conservative in the application of his doctrines than he was in their abstract formulation. When asked to legislate for Corsica and Poland, he gave cautious advice and justified it as a concession to corrupt human nature.

Voltaire saw in English protection of person and property, liberty of speech, trial by jury, and religious tolerance, all the natural rights that a man could want. Nevertheless, he believed that all states had originally been republics such as were depicted in the histories of Greece and Rome, and in contemporary accounts of Indian tribes. Helvétius laid down the principle that government ought to have no other object than to promote the happiness of the majority. To insure happiness he thought civil liberty necessary for all and the right to participate in government necessary for the educated and propertied citizen. More consistently radical was Holbach who, in politics as in religion, swept away all compromises and included kings, priests, and gods in a single condemnation. In his elaborate *Système Social* (1773) he set forth a doctrine of the social pact as a foundation for the demands of liberty and equality for all.

5. POLITICAL ECONOMY

As in political, so in economic theory, the lead was taken, during the eighteenth century, by French thinkers. Germans and Italians were content, on the whole, to leave

¹³ This is one of the definitions in Littré: *Dictionnaire de la Langue Française*. See also Crane Brinton in the *Encyclopædia of the Social Sciences*, i, 127.

economic as well as civil matters to their governors. The prosperous British and Americans generally preferred to enjoy their wealth than to reason upon it. But in France the fearful mismanagement of affairs by the government gave the public food for furious thought. Colbert's policy of government regulation of industry and commerce had cramped all free initiative and all the processes of healthy gain in chains of iron. The reaction against this fatal administrative interference gave rise to the liberal school of economists commonly called the Physiocrats.

They started with the axiom, common to all their contemporaries, of the rule of natural law in social phenomena. The circulation of money is as subject to natural forces as is the circulation of the blood. The task of the economist is to ascertain the laws of nature; the task of the ruler is to apply them. In general, they thought, freedom in industry and trade would best allow healthy processes to operate and would suffice to promote general prosperity and happiness. The interests of society they thought best served by the self-interest of individuals, each working for his own profit. Hence, their maxim was expressed in the words "*laissez faire, laissez passer*"—let things alone, let them take their course.

Strongly did they react against the older mercantile theory that the wealth of nations consisted in the abundance of gold and silver. On the contrary they thought of agriculture and the extractive industries such as mining and fishing as the primary sources of national wealth. The manufacturer and merchant did, indeed, create wealth, but only enough to pay them for their labor. But the cultivator of the soil, the miner and the fisherman, they said, each secured not only the wages of his labor but a surplus product on which in the final analysis, all classes of the population lived. They therefore advocated a single tax on land because they believed that land would pay it in the end, and would better pay it directly than by circuitous and costly indirection. Whatever the errors of a doctrine too simple and too logical to fit the facts altogether, its proponents sub-

stituted for detached speculation upon commerce a consistent theory of the industrial aspect of society.

Early in the century Vauban and Boisguillebert attacked the mercantile theory of wealth, asserted that "the true riches of a kingdom consist in the abundance of goods necessary to life," and argued for the play of free initiative to produce the maximum of these goods.

In *The Spirit of the Laws* Montesquieu investigated economic processes. He advanced the ideas that population will increase under good government and under laws dividing up the land equally, that machines save labor and hence perniciously reduce the number of laborers, that money is a mere sign of the value of articles, and that interest and prices vary in inverse proportion to the quantity of money in circulation. The same ideas, together with a cogent plea for liberty of commerce and industry, appear in the works of Condillac.

More important in this field was the work of François Quesnay (1694-1774), who wrote the articles on "Fermiers" and "Grains" in the *Encyclopédie* (1757) and a *Tableau Économique* (1758). He argued that as "agriculture is the most productive and noble part of economic life" it should be encouraged at the expense of manufactures of unnecessary luxuries. The population as a whole he divided into three classes: the productive, or agricultural; the proprietary, or class of landowners; and the sterile, including all occupied in other work than agriculture.

Next to Quesnay the most influential of the Physiocrats was Anne Robert Jacques Turgot (1727-81), whose fame as an economist led to his appointment for two years (1774-76) as comptroller-general of the French treasury. At the early age of twenty-two he wrote a treatise on the currency pointing out the mistake of issuing unlimited paper money. As money is a standard measure it must be fixed. Changing the amount in circulation simply changes the general level of prices. In 1766 he published his *Reflections on the creation and distribution of Wealth* in order to sustain the ordinary Physiocratic thesis of the superiority of the pro-

ducer over the artisan. By producer he meant the agricultural laborer or miner who brings new articles into use, thus creating wealth over and above his wages. By artisan he meant the laborer in manufacture or commerce whose production of wealth he believed to be limited to his wages, and these again to be limited, by competition, to a bare sustenance.

While the Physiocrats rationalized the interests of the bourgeois class, a few theorists of the extreme left anticipated the Socialists of the nineteenth century in demanding economic equality in the interests of the proletariat. Communism of a sort can be traced back to Sir Thomas More and to the Anabaptists, to some medieval thinkers, and perhaps to the primitive Christians and to Plato and Pythagoras. But it received little serious attention until the growth of big business following the commercial revolution, the development of economic science, and the general secularization of society made it possible to form a consistent body of socialist doctrine. The gospel of Jean Jacques seemed to preach economic as well as political equality. Moreover, the reformers of the eighteenth century harbored the old ascetic view that luxury is harmful to society and morally wrong. Hence, those who attacked property enjoyed one advantage then that they have now lost.

At least four writers should be mentioned as advancing socialistic doctrines. The Curé Meslier left a book, published after his death, consigning religion, the clergy, kings, nobles, and the rich to perdition as usurpers and oppressors of the masses. A certain Morelly published a *Code de la Nature* (1775) asserting that property is the source of vice and injustice and advocating retrogression to the state of nature. A lawyer named Linguet in 1763 launched an attack on law and property for which he was disbarred. Charging that law is the chief instrument by which the possessing classes retain their unjustly acquired wealth and power, he proceeded to advance the main tenets later made known by Karl Marx: the doctrine of surplus value, the theory of the class war, and the prediction of the inevitable

communist revolution. Finally, Bonnot de Mably (1709-85) in a tract named *Doubts proposed to philosophic economists on the natural and essential order of political Societies* (1768) and in other works, brought the whole case for socialism to a unified system, and argued that the chief end of government should be to maintain citizens in equality of fortune and position.

The same reasons that made English political theory more conservative than that of France, made her economic theory more conservative also. French theory in both fields was a conscious protest against intolerable conditions. The British government, wiser and more moderate than the French, provoked less violent attack, or rather won admiration and defense. Britain exiled her fallacious doctrines, like traitors, to France, or deported them, like felons, to the colonies. That perennial delusion that financial ills can be cured by large issues of paper money, found its chief defenders, in that age, in John Law, the Scotch founder of a French Royal Bank and promoter of the Mississippi Company, and in Benjamin Franklin. Both France and the American colonies suffered severely from the application of this nostrum.

But Britain herself, under the wise guidance of liberal statesmanship, escaped the evils felt by other lands. Side by side with the political revolution of 1688-89 went an economic revolution. From this time forth the government, while still binding commerce by navigation acts, began to let industry take its own untrammelled course. Without much fuss or much discussion the principle of laissez-faire was adopted as the basis of the industrial régime.

The mercantile theory, attacked by Sir Dudley North, and by the author of an anonymous treatise on *The East India Trade* (1701), was still defended by Charles Davenant and by John Locke. "Gold and silver," said the last named, "though they serve for few, yet command all, the conveniences of life, and therefore in a plenty of them consist riches." In another respect, however, Locke advanced the theory of political economy so much that, in the opinion of

Macaulay, his genius burned brighter in his *Considerations of the Consequences of lowering the Interest and raising the Value of Money* than it did in his *Essay concerning Human Understanding*. This important pamphlet demonstrates that interest, the price of money, cannot be regulated by law. Attempts to do this will but prove an obstacle to borrowing, lending, and trade, will increase the advantages of bankers and lawyers and will prejudice widows, orphans and other simple people with capital to invest. Interest, Locke argues, depends on natural supply and demand.

The first Englishman to envisage the whole range of economic life as a proper subject of inquiry was Josiah Tucker (1713-99) who was educated at Oxford, served as parish priest at Bristol and then as dean of Gloucester. Though he recognized the subordinate impulse of benevolence, he regarded self-interest as the psychological basis of economic life. Dissenting from the mercantile view of wealth, he proposed as the objects of state policy the increase of population and its diffusion through the countryside, rather than its concentration in towns. If in this matter he but repeated an ancient demand, he struck a new note in defending labor-saving machinery as ultimately productive of growing social income.

The best of the British economists before Adam Smith was his friend David Hume, whose *Political Essays* (1752)¹⁴ advanced many views then original and later generally accepted. Attacking the mercantile theory that wealth consists in the abundance of gold and silver, Hume urged that "men and commodities are the real strength of any community. . . . In the national stock of labor consists all real power and riches." Prices, he proved theoretically and historically, depend on the proportion of money and commodities; prohibition or restraint of export and import of money or commodities is harmful, and free trade is therefore recommended. This position was so cogently demonstrated that, some years before Adam Smith's *Wealth*

¹⁴ Hume: *Essays*, ii, no. 3, "Of Money"; no. 5, "Of the Balance of Trade."

of *Nations*, British statesmen had abandoned the mercantile theory, and had espoused the cause of free trade.¹⁵

British policy, consulting the needs of the industrial and commercial capitalists, seemed less happy in advancing the prosperity of the masses. The statesmanship extolled by the merchant as fostering the national wealth was denounced by the proletarian as sacrificing the interests of the masses to those of the rich. Something like a socialist protest against the unequal distribution of wealth is voiced in two poems by Oliver Goldsmith, *The Traveller* (1764) and *The Deserted Village* (1770). The first offers "moral reflections" on the unpleasing prospect of England's rich growing richer and her poor poorer until we have

Seen Opulence, her grandeur to maintain,
Lead stern Depopulation in her train,

and whole families

Forced from their homes, a melancholy train,
To traverse climes beyond the western main,
Where wild Oswego spreads her swamps around
And Niagara stuns with thund'ring sound.

A still darker picture of the ills of society is painted in *The Deserted Village*. In the prefatory dedication to Sir Joshua Reynolds the author says:

For twenty or thirty years past, it has been the fashion to consider luxury as one of the greatest national advantages; and all the wisdom of antiquity in that particular as erroneous. Still, however, I must remain a professed ancient on that head, and continue to think those luxuries prejudicial to states by which so many vices have been introduced and so many kingdoms have been undone.

Then follow the two pictures of a village as it once was and as it is now. Formerly sweet Auburn had flourished in health and plenty; now it has declined into poverty:

¹⁵ Edmund Burke: *Observations on a late Publication*, 1769; Works, Bohn ed., i, 223.

Ill fares the land, to hast'ning ills a prey
 Where wealth accumulates and men decay:
 Princes and lords may flourish, or may fade;
 A breath can make them, as a breath has made;
 But a bold peasantry, their country's pride,
 When once destroyed can never be supplied. . . .
 Ye friends of truth, ye statesmen who survey
 The rich man's joys increase, the poor's decay,
 'T is yours to judge how wide the limits stand
 Between a splendid and a happy land.

While English thought was oriented by the revolution in the past, and while French thought pointed unmistakably to the revolution in the future, German social science rationalized her existing order of unrevolutionary development. This existing order was that known to history as "the enlightened despotism." Conservative, interested more in religion and philosophy than in politics, distributed through a number of quasi-independent states, feeling the need of peace and of order more than of liberty, the middle classes of Germany were content to forego the enjoyment of those rights successfully asserted by the English and ardently desired by the French. But, as the feudal order gave place to a capitalistic society, the monarchs found it to their interest to foster the prosperity of the people. The real founders of the enlightened despotism were the four great Hohenzollerns who by careful administration and by military genius made Prussia, with a small population and a barren soil, one of the five Great Powers. Refusing to squander large sums on pomp and luxury, they remodeled the finances, cultivated the prosperity, improved the administration, and drilled the army of Prussia to the highest point of efficiency yet known. Their policy, followed by Austria and by other German states, aimed first of all at national aggrandizement. Primarily as a means to this, and secondarily in deference to the growth of public opinion, they reformed the law and practiced a tolerance and justice in advance of their age.

Notwithstanding the prestige of French philosophy in

Berlin, the real moulders of Prussian policy and exponents of German theory were her own lawyers and financiers. Leibniz himself devoted much time to administration, to the reform of legal procedure, and to political science. The purpose of this science he defined as "the promotion of the empire of reason," and the reduction to it of arbitrary power.¹⁶

The state [said he elsewhere] is a great society of which the purpose is the common security. We may hope that it will be possible to give men more than security, namely, happiness, and we should try to do so; but security at least is essential.¹⁷

Agreeably to these principles the ministers of Prussia and of other German states laid the foundations for a comprehensive system of government. J. H. G. von Justi, a servant of Frederick the Great, embodied his maxims in a two-volume work, published in 1755 under the title: *Political Economy: or, a systematic Treatise on all the economic and administrative Sciences required for ruling a Land*.¹⁸ J. von Sonnenfels, a minister of Maria Theresa, set forth similar doctrine in a three-volume treatise called: *Fundamental Maxims of Administration and Finance*.¹⁹

The economic theory expounded in these and similar works is known as cameralism. It is really a variety of mercantilism, modified to suit German needs. Less stress was laid on foreign commerce and a favorable balance of trade, and more on the development of internal resources. The primary considerations of statesmanship, according to these writers, is the increase of wealth, population, and military power.

Outside of France, Germany, and the British Empire, the political theorists developed little new and important thought. A Swedish clergyman, Anders Chydenius, pub-

¹⁶ *Correspondenz mit der Kurfürstin Sophie*, ii, 267.

¹⁷ *Ibid.*, iii, 143.

¹⁸ *Staatswirtschaft, oder systematische Abhandlung aller oeconomischen und Cameral-Wissenschaften die zur Regierung eines Landes erfordert werden*.

¹⁹ *Grundsätze der Polizey, Handlung, und Finanz-Wissenschaft*. 3 vols. Vienna, 1765-76.

lished in 1765 a work on *The National Gain* in order to plead for less government in business. Sharing to the full the belief of his contemporaries in the teachings of Nature, he argued that the best guarantees of national prosperity were individual initiative and self-interest unhampered by the laws. In this liberalism he echoed Quesnay and anticipated some of the work of Adam Smith.

Similar laissez-faire maxims were advanced in Italy by Sallustio Antonio Bandini¹ (1677-1760), archdeacon of the cathedral of Siena, who wrote, about 1737, an *Economic Discourse* not published until 1775. Indignant at the misgovernment of Tuscany he demanded free trade in grain, the abolition of government price-fixing, and the replacement of obsolete and mischievous imposts by a single tax on land. Beccaria, the reformer of the criminal law, gave some lectures on *The Elements of Political Economy* (written 1769-70, published 1804) advancing new views on the relation of population to subsistence and on the division of labor and on wages. In these latter doctrines he, like so many of his contemporaries, prepared the way for the classic treatise of Adam Smith.

Beccaria's friend, Count Pietro Verri, wrote much on the economic problems of his time. This scion of the Milanese nobility, educated by the Jesuits, served the imperial government first in the army and then as a civilian in his native city. Brought into contact with financial problems as a practical administrator, and deeply read in the French encyclopedists, he evolved several new theories. In advocating free trade and lowering prices, he represented the laissez-faire school. In defending luxury as a political benefit, though admitting it to be a moral evil, he marked the transition from the medieval to the modern view. His most original idea, worked out in pursuit of economics as "the science of human welfare and happiness," was that of the optimum population of a given territory as that which could be supported in comfort. Most of his predecessors and many of his successors had regarded a large and growing population as always desirable. Only recently have

thinkers begun to return to the ideal of Verri in making the quality rather than the quantity of life the criterion of policy.

Less advanced than Verri in his views of trade, Ferdinando Galiani (1728-87) surpassed him and perhaps all his contemporaries in his insight into the nature of money. Educated at Naples, influenced by Vico and by Locke, he published in 1750 his treatise *Della Moneta*, analyzing the concept of value, which he found dependent on a combination of utility and scarcity. In the case of goods, he believed that price tends to be proportional to the amount of labor put into each article.

CHAPTER VII

HISTORIOGRAPHY

I. THE IDEA OF PROGRESS

No whit less amazing than the triumphs of natural science in modern times has been the achievement of historiography. The same patient industry, intense thought, and blazing intuition that have enabled the human mind to unravel the secrets of the solar system have been applied with equal success to investigating and reconstructing the story of society. Modern historiography, however, is even younger than modern science. The Age of the Great Renewal saw astronomy and physics grow to maturity; the Age of the Enlightenment saw historiography advance far on the road to perfection. If it is true, as it undoubtedly is, that the general thought of the Enlightenment was dominated by science rather than by history, that is because it takes a generation or two for discoveries to become common property. Seventeenth-century physics and mathematics oriented eighteenth-century philosophy and political theory; eighteenth-century historical investigations made the nineteenth century the most historically minded of all ages.

The great achievements of the historians of the Enlightenment were three: the establishment of the idea of progress as the key to the philosophy of history; the perfecting of a method of assembling, sifting, criticizing, and interpreting the sources; and the broadening of the content of historical narrative to include social and cultural as well as political phenomena. In every one of these improvements France took the lead, and assumed a hegemony in the social studies as notable as that of England in the natural sciences. The immense progress of historiography at this

time was due primarily to the influence of Newtonianism. That documents can be treated with the same systematic thoroughness as the phenomena of nature, that human society is subject to natural law, and that intellectual history is the most important part of the annals of the race, were all ideas suggested by the celestial mechanics of Copernicus, of Galileo, of Kepler and of Newton. In addition to this, the rise of the third estate injected an interest into the social arrangements of the people as distinct from the activities of kings and ministers.

One must not imagine that all the historians of this period advanced with equal rapidity in all lines, still less that the works of the leaders immediately influenced public opinion. Along with the good, new method and interest, there remained much of the old-fashioned both in the books produced and in the popular conception of the proper field of history. Many readers still valued the story of the race chiefly for its literary or romantic charm; many prized it as a storehouse of moral, political, and patriotic lessons. According to Addison the chronicler should portray battles and intrigues with such art as to raise suspense and enlist the sympathies of the reader with one side or the other, playing alternately upon his hopes and fears. Such a program, all too faithfully followed by the practitioners of the art, led many people to suspect that the whole record of the race is nothing but a romance in which any man might believe whatever suited his fancy. This is the suspicion voiced by Henry Fielding,¹ and more fully expressed by Dr. Johnson,² when he said:

We must consider how very little history there is—I mean, real, authentic history. That certain kings reigned, and certain battles were fought, we can depend upon as true; but all the coloring, all the philosophy of history, is conjecture.

More hostile critics found the annals of nations not only unreliable but noxious. Rousseau³ thought that history

¹ *Joseph Andrews*, ii, 29.

³ *Émile*, Book III.

² Boswell's *Life of Johnson*, ii, 356.

calumniates humanity by painting the vices rather than the virtues of men and by devoting its space to wars and revolutions rather than to good, quiet times. On the contrary it should be studied and written for its moral lessons, and for the discovery of general laws.

The pragmatic view was most eloquently set forth by Bolingbroke in eight letters on *The Study and Use of History* (1735-36). Treating meticulous erudition as pretentious ignorance, he proposes as its antithesis the drawing of "political maps" as guides to civic virtue, and points to Machiavelli and to Sarpi as the masters of this method. Denying reliability or usefulness to the records before the year 1500, he sketched a history of Europe since that time intended partly as a vindication of his own unscrupulous career.

How unhelpful for the elucidation of social phenomena this method proved may be gathered from the gropings of one of Bolingbroke's contemporaries to ascertain from history the laws of revolution. This unknown author of a preface to a widely read book⁴ states the chief causes of the ruin of monarchies have been six: the sins of the nation; the want of legitimate heirs to the throne; the ambition of men; the lust of the ruler; the effeminate life of princes; heavy taxes and oppression. The reference to moral qualities and the importance assigned to the monarch reveal the superficiality of the views of history commonly entertained in the eighteenth century.

More fruitful for the study of history and immensely important for the making of the modern mind was the rise and spread of the idea of progress. No psychological contrast between the older and the more recent thought is of greater consequence than is the contrast between the backward-looking and the forward-looking mind. The ancients regarded primitive times as the lost age of gold; the medievals esteemed almost all previous periods as happier than their own. The humanist of the Renaissance

⁴ *Collection of Voyages from the Library of the Late Earl of Oxford*, 1745, I, xli.

longed for a return of the age of Augustus and the Reformer sought to restore the purity of the apostolic era. But, beginning in the seventeenth century, men began to look forward and not back, to the future and not to the past, for the era of perfection. The reason for this is simply the triumph of science. By the end of the seventeenth century even the dullest could see that in knowledge of nature his contemporaries were superior to the most renowned of the ancient worthies.

But, as there were still many idolaters of the ancients, they and the champions of the moderns engaged in a furious battle that first brought home to a wide public the idea of progress and gave it that advertisement that a good fight always gives to its cause. The glove was thrown down by Charles Perrault (1628-1703), one of the flatterers of the Grand Monarch, who proclaimed in a poem on *The Age of Louis the Great*:

La docte antiquité dans toute sa durée
À l'égal de nos jours ne fut point éclairée.

The thesis thus launched in 1687 was sustained in a poem published in four parts during the years 1688 to 1696 under the title *Parallèle des anciens et des modernes*. In order to get ammunition for the attack Perrault wrote to Huygens to inquire whether the moderns did not surpass their ancestors in all the arts. Huygens replied that in science many new truths had been discovered during the last eighty years.⁵ Fortified with this information the poet proclaimed that "within the last twenty or thirty years more discoveries have been made in natural science than were made throughout the whole period of learned antiquity"; in fact he added, not very luckily, so much had been recently discovered that there is little left for future generations to learn. In general he believed that knowledge normally advances, though in certain periods, like the Middle Ages, some of it might be lost. Especially did he protest against that idolatry of the classics so common in his age and long before it:

⁵ *Œuvres de Huygens*, ix, 301 (1688).

La belle antiquité fut toujours vénérable,
Mais je ne crus jamais qu'elle fut adorable.
Je vois les Anciens, sans plier les genoux,
Ils sont grands, il est vrai, mais hommes, comme nous.
Et l'on peut comparer, sans craindre d'être injuste,
Le Siècle de Louis au beau Siècle d'Auguste.

The thesis of Perrault, attacked by La Fontaine as attorney for the ancients, was defended by Fontenelle, expanded to other fields than that of science, and moulded into a consistent theory of progress. Fontenelle, a remarkable popularizer of science, published in 1688 a work called *Digressions on the Ancients and Moderns*, to defend the proposition that, as nature is constant in all ages, the gradual accumulation of knowledge must give the later period the superiority. Men have always been of the same size mentally as well as physically, and all generations, therefore, are capable of making discoveries and of producing geniuses. In some ages war, tyranny, and hardship have blighted budding genius, but in most periods men have added something to the intellectual capital of the race. This normally results in progress, that is, in an accumulation of knowledge. Consequently Fontenelle first formulated a doctrine of inevitable and perpetual progress extending not only to his own age but indefinitely into the future.

For some years the controversy continued, with other disputants taking part. While there was never any decision, the champions of the moderns won the favor of the public. It was something like a capitulation when, in 1701, the great critic Boileau admitted, in a letter to Perrault, that, though France could boast of no Cicero or Virgil, yet in tragedy, in painting, in architecture, and especially in philosophy and science, the Age of Louis surpassed the greatest of its predecessors, even the Age of Augustus.

In the meantime the battle had been transferred to England, where it was carried on with considerable energy by famous scholars and writers. The action was opened by Sir William Temple, a man of some political eminence and a

dilettante in letters, but without real mastery of either classical scholarship or of modern science. His *Essay upon Ancient and Modern Learning* (1690) gave the preference to the former in almost every particular and by the most astonishing means. Attacking the moderns in their stronghold, he belittled recent science by doubting the truth of the Copernican and Harveian discoveries, at a time when both had long been accepted by all qualified judges. In his opinion "Thales, Pythagoras, Democritus, Hippocrates, Plato, Aristotle, and Epicurus made greater progress in the several empires of science than any of their successors have been able to reach." Asserting that art had been sterile for a century, and that modern society had been vulgarized by the pursuit of gain, he proceeded to compare ancient and modern literature, and to give the preference to the former by omitting, from the modern list, the names of Dante, Petrarch, Ariosto, Shakespeare, Milton, and Chaucer. In discussing the ancients he made some surprising errors, appealing to the forged *Letters of Phalaris* as genuine. He denied, as contrary to known facts, the two main arguments for steady progress advanced by Fontenelle: first, that men have always accumulated and never lost learning, and, second, that uniform nature must produce the same proportion of genius in all ages. Knowledge, said Temple, has been lost as well as gained; differing social conditions make some ages prolific of genius, and others barren. Hence, in place of the progressive doctrine, he proposed a cyclical philosophy of history.

He was answered by William Wotton in *Reflections upon Ancient and Modern Learning* (1694), a review of the pertinent matter with the conclusion: "The extent of knowledge is at this time vastly greater than it was in former times." Temple's errors in classical scholarship were exposed by Bentley in a famous *Dissertation upon the Epistles of Phalaris* (1697).

Temple was defended, however, at least indirectly, by his renowned protégé, Jonathan Swift. *The Battle of the Books*, a satirical poem written about 1697 but not pub-

lished until 1704, describes an engagement between the ancient and modern authors drawn up in array like two Homeric armies. While some of the late born chiefs do doughty deeds, on the whole the old writers get the better of it. The author, in fact, compares the ancients to the bees who make honey and wax (that is, sweetness and light), and the moderns to spiders, producing venom and filth. The moderns are aided by "a malignant deity called Criticism," and her deformed priest, Bentley.

In England the result of the battle was for a long time indecisive. Defoe in his *Essay upon Projects* (1702) admitted that he was not

absolutely of the opinion that we are so happy as to be wiser in this age than our forefathers, though at the same time I must own some parts of knowledge in science as well as art have received improvements in this age altogether concealed from the former.

A like temperate judgment was expressed by Lord Chesterfield, who bade his son (1748)

speak of the moderns without contempt and of the ancients without idolatry; judge them all by their merits but not by their ages.

In America, optimistic and rapidly changing, the preference for modernity and the doctrine of progress early found a congenial soil. The following extract from the *Virginia Gazette* ⁶ of 1737 doubtless reflects the prevalent opinion:

The world, but a few ages since, was in a very poor condition as to trade and navigation. Nor, indeed, were they much better in other matters of useful knowledge. . . . All our knowledge of mathematics, of nature, of the brightest part of human wisdom, had their admission among us within the last two centuries. . . . The world is now daily increasing in experimental knowledge, and let no man flatter the age with pretending we are arrived to a perfection of discoveries.

While the idea of intellectual progress was obtaining currency among the public, it was enlarged to include the doc-

⁶ Cited by J. T. Adams: *Provincial Society*, 273.

trine of social approach to perfection by certain French thinkers of whom the first was the Abbé de Saint-Pierre, a Deist and utilitarian inspired by the love of mankind ardently to desire their happiness. In his *Observations on the Continual Progress of Universal Reason* (1737) he argues that as the race is yet in its infancy, being only seven or eight thousand years old, and as improvement is constant except when interrupted by war, superstition, and despotism, it is natural to suppose that the process of amelioration, acting throughout future ages, will eventually bring about a highly desirable state of society. Quite in the spirit of the time, he counts upon the improvement of the social even more than of the natural sciences to produce the happiness that he regards as the natural goal of historic change.

An attempt further to explain this process was made by Turgot, who designed, though he did not complete, some *Discourses on Universal History* (1750). Influenced negatively by Bossuet, whose general theory of the providential guidance of history he wished to refute, and positively by Montesquieu and Locke, he set about to discover, in the psychology of the passions and in a study of environment, the laws of social development. These laws, he emphasized, are not like the laws of nature, for nature is static and humanity is dynamic. That is, nature is always the same, but humanity is ever changing. In a very modern spirit he finds the key to these changes chiefly in the discoveries of geniuses, and he recognizes that these are dependent to some extent upon the social *milieu*. Decadence of taste and "boredom with the beautiful" blighted discovery; liberty of thought and the multiplication of books by printing stimulated it. Like Vico and Compté he discovered three stages of intellectual progress in the chronicles of the world, the first stage being religious or animistic, the second metaphysical, and the third scientific. Like other men of his age he assumed, without proving, that moral and political improvement follow scientific advance.

Among the writers to express similar ideas were the Swiss historian Isaak Iselin (1764) and the English publicist

Joseph Priestley. The latter, in an *Essay upon the Principles of Government* (1768), attacked existing institutions but pointed to a golden age in the future "glorious and paradisaical beyond what our imagination can now conceive."

Nature [he continued] including both its materials and its laws, will be more at our command; men will make their situation in the world abundantly more easy and comfortable; they will probably prolong their existence in it and will daily grow more happy.

Despite Rousseau's theory of historical regress, the idea of progress daily gained ground. A more detailed prophecy of the happy future than had yet been undertaken was made by Sébastien in 1770, in a French work called *The Year 2440*. Amid merciless criticisms of the existing government of France he prophesies the abolition of slavery, the renunciation of errors by the pope and his return to primitive Christianity, the reform of the French monarchy, still standing, the general acceptance of Deism as the established religion, and the treatment of atheists by a course in physics in order to cure them of their errors.

Somewhat apart from his contemporaries stood the most original historical thinker of the eighteenth century, Giam-battista Vico (1668-1744). The son of a small bookseller of Naples, pensive and melancholy even as a boy, bred to the law, devoted to poetry, he first turned his keen insight on the field of jurisprudence with the hope of discovering the idea of eternal and absolute law. In significant opposition to the prevalent spirit of the age, he turned with disgust from mathematics and physics, and from the speculations of Descartes and Gassendi, to find in the poets, orators, and historians the philosophy he sought. After publishing several tracts on law and on the wisdom of the ancients, he competed for the chair of jurisprudence at the University of Naples but failed to secure the appointment. This defeat he later came to regard as a blessing in disguise, because lack of professional occupation left him leisure to complete a great work entitled *Principles of a New Science treating*

the common Nature of Nations. The first edition, of 1725, was thoroughly rewritten in the second edition (1730) and still further improved in the third (1744).

The treatise is an imaginative and in parts penetrating attempt to discover the laws of history not in the mechanical processes of Newtonian physics but in the rhythm of the human mind. After laying down, in his first book, axioms, data, principles, and method, the author develops his thought in the second book under the title *Poetic Wisdom*, with the subdivisions of poetical metaphysics, poetical ethics, logic, economics, politics, physics, astronomy, and geography. The third book is a digression on the Discovery of the true Homer. The fourth book expounds the notion that mankind has passed in succession through three states, the divine, the heroic, and the human, and that each state of civilization has produced its own characteristic laws, customs, governments, languages, and institutions. In the first stage, that of the savage, the world is *felt* rather than rationally conceived. The second stage is that of imaginative knowledge, or "poetical wisdom," which corresponds to the higher barbarism. The third stage is that of knowledge and civilization. In politics the first state is that of theocracy, the second that of aristocracy, the third that of free peoples, including monarchies and republics. These stages succeed one another in a cyclical sequence which does not exclude the possibility of progress, for the states of successive cycles though similar are not identical.

One of the most striking of Vico's ideas is that of the group mind. Most of his contemporaries, as well as previous historians, had conceived of historical change as wrought either by the direct intervention of Providence, or by the genius of great legislators. Vico advanced the very modern conception of the collective mind as the creator of an ever moving civilization. In the background of his thought is the fruitful conception of social evolution, together with the perception that every phase of culture is related to every other phase.

In short, Vico's achievement was the formulation of a

philosophy of history so much in advance of its time that it was not much prized until the era of Romanticism. In Hegel's idealistic philosophy of history, in Auguste Comte's notion of the three stages of progress, in Croce's philosophy of the spirit, in Oswald Spengler's poetic reconstruction of cultural evolution, we see the harvest of the seed sowed by Vico. His admirer, Croce, finds in him many more things than these—anticipations of Max Müller's interpretation of mythology, Grimm's reconstruction of primitive culture by philology, Niebuhr's and Mommsen's conception of early Roman history, Wolf's theory of the Homeric epic, Savigny's school of jurisprudence, Fustel de Coulanges's conception of the Middle Ages, De Sanctis's criticism of Dante, and Marx's idea of the class war. Such an exaggerated appreciation of Vico's merits reads into his seminal hints thoughts really unborn until they were more highly developed, and generally from other sources than Vico, by more careful, more systematic, and better informed minds than was his. Enough glory to him that we can find in his preliminary sketch a rich and suggestive anticipation of some later thought.

2. HISTORICAL METHOD

Less to speculators on general laws than to the perfecters of a sure method of establishing facts does modern historiography owe its marvelous conquests. Both fact and theory are needed; but the patient drudgery of accumulation and criticism of material has often repelled those brilliant minds attracted by the gaudy charms of imaginative theory. Until the end of the seventeenth century no reliable method of examining and sifting sources had been developed. Most historians relied chiefly on their predecessors or on personal memoirs. An occasional use of documents by Sleidan, an occasional brilliant criticism by Valla, an occasional assertion of the value of archival material by Blondus, prove, by exception, the general rule that most historians, until those presently to be described, had been careless, credulous, and unmethodical in their use of sources.

Soundly based history began to be written, or at least the foundations of it began to be laid, by the Benedictines of St. Maur, in Paris, towards the end of the seventeenth century. Only in the monasteries could leisure and libraries for such a work then be found; only there could coöperative labors be undertaken by a united group of scholars. Only in France, the center of interest in the social sciences, could the new method be called for and appreciated. The new school began at the beginning by forging the tools, till then lacking, for the prosecution of their main work. They cultivated, they almost created, the ancillary sciences of diplomats and paleography. They first demanded an exhaustive examination of documents. They first broke with the humanistic esthetic history. They first cited sources scrupulously to support all their statements and not merely for polemic purposes, as had the earlier church historians. As their ideal was to make dependable works of reference their labor proved more valuable for its exhibition of materials than for synthesis. They perfected the art of detecting the false document, though they stopped short of internal criticism. The defect of their qualities was just this, that they mastered the detailed facts and missed the organic development. Their materials were wonderful; their architecture poor. With their collections of materials are still built in large part the grandiose fabrics of twentieth-century historians. It is too much to ask of any man to master all the arts of a complicated discipline at once. Enough for the Maurists and their imitators that they contributed a vast deal to one essential part of sound historical writing.

If one name must be exalted as the founder of the new critical method it is that of Jean Mabillon (1632-1707) a Benedictine monk of the Congregation of St. Maur and of the abbey of St. Germain-des-Près, Paris. His reading of the ancient monuments of his order led him to develop the proper critical method of discriminating the true from the false documents, and of dating them; this method he expounded in his treatise on diplomats (*De re diplomatica*)

published in 1681. His vast learning and his candor, displayed both in this and in a *Traité des études monastiques* (1691) have made both works valuable even until the present. In the latter tract he stresses the importance of relying only on contemporary and genuine authorities, tested by a truly critical spirit.

In his large *Annales ordinis Sancti Benedicti*, published in six volumes from 1703 to 1739, he practiced his own principles. His thorough and ripe familiarity with the material made this work the masterpiece and model of the new school. Distorting or suppressing nothing in the interests of piety, believing miracles accredited in genuine sources, he set forth year by year the history of his order as it was won from an exhaustive and critical examination of the documents.

What his historical method lacked—the ability to apply internal criticism to a document and to articulate the whole mass of data—was partly supplied by his successors. The *philosophe* Pierre Bayle began to doubt some facts supported by genuine documents. Honoré de Sainte-Marie, in a treatise published in 1713 under the title *Réflexions sur les règles de la critique, touchant l'histoire de l'église*, first cautioned historians to disregard the fabulous and to be wary in accepting testimony to unlikely events. This caveat was indeed necessary in the interests of the faith itself, for the Benedictines, with naïve confidence, had passed heedless by abysses of absurdity that the Jesuits later found it necessary to fence. It was Henri Griffet, one of these same Jesuits who, in the most important work on historical method since Mabillon, first proposed a psychological classification of sources according to their credibility. He compared a historian to a judge cross-examining witnesses in court, recommended the use of original records only, and cautioned against the acceptance of even contemporary witnesses unless mutually corroborative.⁷

After Mabillon, the first to adopt the new method in a

⁷ *Traité des différents sortes de preuves qui servent à établir la vérité de l'histoire*, 1769.

large work was the Jansenist Louis de Tillemont (1637-98). His *Histoire des Empereurs et des autres princes qui ont régné durant les six premiers siècles de l'Eglise* (published 1690-1738) sets forth a harmony of the sources with such impersonal and scrupulous care as to win from Gibbon the praise that its accuracy amounts to genius. With an honesty content to search for facts and to leave deductions to others, he suppressed nothing except a few things that shocked his prudery. He gave "all the news fit to print."

The new method was rapidly applied to fields other than ecclesiastical. A Maurist, Rivet de la Grange, wrote the first literary history of France founded on the new principles;⁸ Sainte-Palaye the first social history;⁹ Dubos the first constitutional history of France¹⁰ and Rapin Thoyras the first constitutional history of England.¹¹

Next to France Italy produced the largest harvest of critical history during the Enlightenment. Its master in the peninsula, Ludovico Antonio Muratori (1672-1750) born near Modena, educated by the Jesuits, called to Milan by Carlo Borromeo as librarian of the Ambrosiana, and recalled to Modena as librarian of the ducal court, spent a long life in an almost unexampled literary and editorial productivity. The list of his writings, on poetry, law, theology, history, and moral philosophy, fills many pages; and the writings themselves fill many huge volumes. His most important historical works were his *Annali d'Italia* in seventeen folios (1744-49); his *Rerum Italicarum Scriptores* in twenty-five folios (1723-51); and his *Antiquitates Italicae Medii Aevi* in six volumes (1738). The first named work is a history of Italy by years from the birth of Christ to 1749; the second is a vast collection of sources including 116 writings reprinted from earlier editions, and more than 2,000 documents, poems, charters, chronicles, tracts, and statutes printed from manuscripts, the whole forming the

⁸ *Histoire littéraire de la France*, 1733 ff.

⁹ *Mémoires sur l'ancienne chivalerie*, 1759 ff.

¹⁰ *Histoire critique de l'établissement de la monarchie française dans les Gaules*, 1735.

¹¹ *Histoire d'Angleterre*, 1723 ff.

most imposing body of materials for national history as yet collected. The last named work is a series of dissertations on phases of Italian medieval culture.

The Maurist method, with modifications for the better and for the worse, was brought to Germany by Leibniz. Though the fame of this universal genius rests mainly on his philosophy, he himself spent more thought and labor over history than over any other branch of his multifarious activity. His first purpose, to glorify his country and some of its great houses, led him to investigate medieval German chronicles by extensive researches in the archives, which resulted in the voluminous *Brunswick Annals of the Western Empire*, written during the years 1703-1716, but not published until the middle of the nineteenth century. Confining himself to the deeds of princes, rationalizing miracles whenever possible, collecting rather than organizing his materials, he followed in most particulars the method of the Maurists. In 1679 he had already worked out independently the principles of criticism which he well expresses in the following letter: ¹²

A historian is simply a witness recording his testimony in writing that it may be publicly known and may go down to posterity. Good faith is therefore needed in the witness and in his writing. The credit to be given to the witness must be gauged by his animus and by the safeguards and impediments to his judgment. In evaluating his testimony we should especially seek to learn whether it has come to us uncorrupted. The intention to deceive may arise in venal motives, as in Paulus Jovius, or in the ambition to say great and singular things, or in the writer's assuming the pose of a great statesman. . . . Historians are often deceived by the reports of biased persons. . . . True causes of events are rarely detected by human inspection. . . . Histories are trustworthy if sober, severe, and buttressed by many supporting documents. . . . Testimonies should be weighed rather than counted; and all things judged by the degree of probability.

If, in this admirable passage written some years before Mabillon had published anything, Leibniz anticipated the

¹² *Sämtliche Schriften*, I, ii, 426 f.

best teachings of the Maurists, in another passage, written still earlier, he demanded the cultural and intellectual history later to be supplied by Voltaire. He proposed, in 1670, that history be expanded to include not only politics, genealogy, and biography, but literature, science, and religion.¹³

The principles of historical criticism were notably advanced in a work on *General-Historical Science*¹⁴ by Johann Martin Chlandi, or Chladenius. Among the first to assert that history is a science, he was perhaps the very first to examine carefully the psychological problem involved in weighing testimony. As every observer has a particular angle of vision, and as senses, perceptions, and language are all unconsciously deceptive, the author rightly urges the consideration of these matters in evaluating narratives.

To a German of the late seventeenth century we owe the division of universal history into the ancient, medieval, and modern periods, a division immediately accepted by his contemporaries and still accepted by most writers. The germ of the idea can be traced back to the humanists who believed that the two great ages of the world had been that of classical antiquity and their own, and who regarded the intervening centuries as a middle period that did little but fill in between the fall of Latin civilization and its revival. The phrase "media tempestas" has been traced back to 1469; the synonymous phrase "medium ævum" to 1604. But the threefold division was first introduced into church history by Voetius, who wrote of the *antiquitas ecclesiæ* (to Augustine), the *intermedia ætas* (from Augustine to Luther), and the *nova ætas* (beginning with the Reformation). From church history this periodization was adopted for universal history by Christian Cellarius who wrote a *Historia Tripartita*, or history of the world in three volumes entitled respectively *Historia Antiqua* (1685), *Historia medii ævi* (1688) and *Historia nova* (1696).

The German church historians of the Enlightenment im-

¹³ *Sämtliche Schriften*, I, i, 91, 103.

¹⁴ *Allgemeine Geschichtswissenschaft*, 1752.

proved slightly upon their predecessors by abating somewhat of their dogmatic virulence and by organizing their material to form the story of a religious society, rather than the record of doctrinal debate. The German Pietist, statesman, and scholar, Ludwig von Seckendorf, published a vast *Historical and Apologetic Commentary on Lutheranism and the Reformation* (1688) in order to defend the principles of the Reformers before a world growing skeptical of their value or importance. Johann Lorenz Mosheim, in a *History of Modern Christianity* (1741) to some extent expanded and secularized the current Protestant version of the Reformation. Far better in these respects were the secular German histories of Michael Ignaz Schmidt and of Justus Möser.

In England as elsewhere the scholars of this period compiled vast collections of sources so solid that they are still usable today. Sir William Dugdale's *Monasticon Anglicanum* (1655-73) an account of English monastic houses, Anthony Wood's *Antiquities of Oxford and Oxford Athens*, Joseph Ames's *Typographical Antiquities* (1749), and Thomas Rymer's *Fædera* (15 volumes, 1704-35), made accessible an enormous amount of source material, either by the publication of documents or by information drawn from archival manuscripts.

Gilbert Burnet (1643-1715), the best English historian of the early Enlightenment, is extremely difficult to classify. Standing at the end of one age and at the beginning of another, he had in him something of both, as well as something individually his own. Born in Edinburgh, drawn to England and to the Anglican church in which he took orders, he rose in his profession and in politics until he became Bishop of Salisbury and one of the most trusted advisers of King William and Queen Mary.

His first important work, a *History of the Reformation in England* (3 volumes, 1679-1715), is one of that long controversial series to which the works of Sanders and Maimbourg and Seckendorf and Bossuet belong. While proposing an apologetic end, he nevertheless determined, as

a sincere Protestant and an honest man, to ascertain the truth and to tell it as far as he was capable of doing. He examined the manuscripts in the government collections, bought some for his private library, and obtained access for a short time to the great collections of documents made by Sir John Cotton. In using these, Burnet made many blunders in transcription and in interpretation. In one instance I have detected him in suppressing a fact damaging to his cause, though it must have been known to him. When Henry VIII contemplated divorcing Catherine of Aragon, he asked the opinion of many of the German Reformers some of whom, including Bucer, advised him that bigamy would be a better solution than divorce. Though Burnet certainly knew Bucer's letters on the subject, he merely recorded, in his history, that Bucer "was of another opinion" without telling what it was.¹⁵ But this, apparently, was an extreme case. When the strain on his confessional loyalty involved anything less than the admission that a Reformer favored bigamy, he was capable of dealing faithfully with his material. The book received the thanks of Parliament as a signal defense of the Protestant cause.

In a second great work, *The History of My Own Time*, published posthumously in two volumes in 1724 and 1734, the author appears to better advantage, and gives the critic more difficulty in classifying him. Something of an antiquarian, a preacher, a pamphleteer, a debater, a theologian, and a politician, he appears to be a mixture of Clarendon and Saint-Simon, with a dash of Voltaire. Like Clarendon he wrote the apology of a party; like Saint-Simon he delighted the public with court gossip; like Voltaire later he evinced considerable interest in cultural history. And this Whig Clarendon, this moral Saint-Simon, this Christian Voltaire, wrote a style which, though not pure enough to suit the taste of Swift, is generally clear, often lively, and sometimes eloquent.

America, too, felt the compulsion of the time-spirit urging

¹⁵ See my article on "The Divorce of Henry VIII," in the *English Historical Review*, October, 1912, 679.

to the production of learned history. In general, it must be said that the American historiography of the eighteenth century is less attractive than is that of the seventeenth. With all their limitations, there is something singularly noble and magnanimous in the works of Bradford and Winthrop, works written by men as great in action as they were eloquent in speech. Their descendants were epigoni, investigating with care and recording with more piety than discrimination the deeds of the founders.

Among these ~~second-rate men~~ the first place must be given to that prodigy of piety, ambition, and conceit, that leviathan of learning and of letters, the Reverend Dr. Cotton Mather, of Boston (1663-1728). Among his four hundred works—more or less—the most notable is surely his *Magnalia Christi Americana, or, The Ecclesiastical History of New England*, published in London in 1702. The first of its seven books describes the discovery of America, together with a discussion of the Biblical prophecies of the same; the second records the lives of the early governors of New England; the third sketches the lives of sixty of her leading divines, the fourth contains the chronicles of Harvard College; the fifth compiles public acts of the churches in New England; the sixth recites the “Illustrious and Wonderful Providences, both of Mercies and of Judgments of divers persons,” and the seventh chronicles “The Wars of the Lord,” both against heretics and against Indians.

While the work is disfigured by priggishness, pedantry, bias, superstition, flabby declamation, and hasty carelessness, it deserves at least the praise of evincing great learning and indefatigable industry. But for Mather much of value in the early history of New England would be entirely lost. His work, inferior though it is, is yet the counterpart of the labors of Mabillon and of Muratori. It is the *Annales Novæ Angliæ* and the *Acta Sanctorum Americanorum* rolled into one.

Much more attractive, though less learned and massive, was the *History of Virginia* published by Robert Beverley in 1705. The author, a wealthy planter and a member of

the ruling aristocracy, ripened the genial culture and knowledge of the world acquired in his province by a visit to England. When he was asked by a London bookseller to compose an account of Virginia, he gathered a large mass of information from the records and previous descriptions of the colony and put them into a book written in so sprightly a style as never to seem dry.

In the same class with the works of Mather and Beverley fall two other scholarly and informing narratives, Thomas Prince's *Chronological History of New England* (1736), and William Stith's *History of the First Discovery of Virginia* (1747). Prince, the minister of the Old South Church at Boston, collected a thousand books, pamphlets, and papers, and several hundred manuscript letters and documents left by the early settlers in New England. With the aid of these he began to compile a chronology of "remarkable providences," the deaths of prominent men, elections, grants of land, foundation of churches, ordination and removal of ministers, the erection of important buildings, laws, executions, wars, and battles, and did the work so thoroughly that he got only to the year 1633. In marked contrast to Mather's lax amplitude, Prince, quite in the style of the modern monographer, aimed at an exhaustive and minute accuracy. In this respect his work stands the severest tests that can be applied to it. A brief period in the annals of a small country was never treated with more patient industry and fidelity than was the early history of New England by Prince. And in these respects William Stith, the President of William and Mary College, deserves equal praise.

It is proper to end this section on the development of historical method with a few words on the formation of early historical societies. The need for libraries, for endowed leisure, and for the union of scholars in a single body for collaboration, was met in some Catholic countries by the monasteries. When these had ceased to exist in Protestant lands, or had failed to supply the requisite materials in some Catholic nations, and before the universities

stepped into the breach, the felt need called into being a number of societies devoted purely to historical and antiquarian research. Their history in many respects resembled that of the scientific academies. The first of them was the Society of Antiquaries founded, as a private venture, in London, by Matthew Parker, Archbishop of Canterbury, Sir Robert Cotton, the great collector of manuscripts, and others, in 1572. In 1589 they applied for a charter of incorporation as "an academy for the study of antiquities and history," with what result does not appear. If Elizabeth failed to encourage them, her successor James dissolved them for fear that they would pry too closely into the secrets of the state. In abeyance for more than a century, the society was reborn in 1707, when historical scholars began again to meet at a tavern for dinner, followed by punch, pipes, and papers on learned subjects. In 1751 they finally obtained a charter from George II.

In the meantime the Prussian Academy of Sciences was founded in 1700 and, unlike its predecessors, given a department of history. The purpose of the government in doing this is thus explained in the General Instructions issued at the time: ¹⁶

We wish also that our Society should apply itself to the important study of histories, especially of the German nation and church, and particularly of our territories, should properly describe everything and prove it on good ground and authentic witnesses, as much as possible from documents, trustworthy writings, and contemporary authors, or other pertinent testimony, in order that the true antiquity of the Evangelical faith and the necessity and character of the German Protestant Reformation should be sustained against the misrepresentation and distortions of opponents, and that the glory of the German nation may be preserved and brought to light.

From this time forth many of the general scientific academies, as for example that of St. Petersburg, had historical divisions. Among the special societies devoted ex-

¹⁶ Harnack: *Geschichte der K. Pr. Akademie der Wissenschaften*, i. 98.

clusively to history the first to be incorporated was the French *Académie des Inscriptions*, which arose from the appointment of a committee of the *Académie Française* to compose inscriptions for medals. After some years of this work, the members of the committee were chartered as a special body in 1701 for the purpose of studying the antiquities and monuments of France. The society was to consist of ten honorary members, ten salaried members, and ten pupils. Similar historical societies were formed in other countries: the Royal Academy of History at Madrid in 1738, the Royal Danish Society for National History and Language in 1746, and the Royal Swedish Academy of Science, History, and Antiquities in 1753.

3. SOCIAL AND CULTURAL HISTORY

It is incumbent upon the historian not only to master a method of finding facts but to choose what facts are worth finding. The records of the past are clogged with a vast mass of personal and petty details, mostly without value. A scholar who counted how many times Chaucer used the word "and," or one who spent years investigating when and where Henry VIII first kissed Anne Boleyn, or compiling a list of the barbers who cut Pepys's hair, would waste his own and his reader's time. But, until Voltaire, half of most histories had been filled with matters not much more valuable than these; and the other half had been limited to treating politics and religion, which are, indeed, important parts, but only parts, of the whole story of social evolution, properly understood. It was the achievement of the Enlightenment to enlarge the content of history to include all social and intellectual phenomena. This was a feat not less remarkable than the improvement of historical method.

In this case as in so many others, the want supplied by the new genre was a more practical one than that of merely explaining the past. What Voltaire and his fellows really wished to do was to "enlighten" the public, that is, to educate them in liberal principles, both political and re-

ligious. Just as the church historians, Protestant and Catholic, had appealed to the records of the past to justify their doctrines, so the *philosophes* appealed to these records to discredit their enemies and to legitimate their own pretensions. This is why the new school arose in France—because the need for reform was most keenly felt in that country.

In voicing the demand for rational principles in politics and religion, and in bringing the institutions of the past before the bar of history, the writers of the new school changed the whole standpoint from which the chronicles of the race had been viewed. Previous historians had seen things from the point of view of the governing classes; those of the eighteenth century saw them from the standpoint of the governed middle class. By this very fact they soon discovered that historical change must be explained by deeper causes than by the arbitrary decisions of rulers. General forces were sought for, and were often found, sometimes rightly, sometimes too hastily. But more important even than this contribution to historical science was the inclusion of social and intellectual phenomena as necessary ingredients in the story of the race.

The exponents of the new genre have been charged with harboring unhistorical judgments, that is, with making no allowance for times and places, and with bringing all previous ages before the bar of their own reason. This charge is only partly true. Voltaire wrote: ¹⁷

It is at present very well known that we are not to judge ancient customs by modern times. He who would go about to reconstruct the court of Alcinous by that of the Turkish Sultan or of Louis XIV would be little applauded by the learned.

It is especially charged in this connection that the eighteenth century was particularly unjust to the Middle Ages, which it regarded as nothing but a long and regrettable interval of ignorance. This charge, too, has a little truth together with much exaggeration. That the eighteenth cen-

¹⁷ *Dictionnaire Philosophique*, s.v. "Ezekiel."

ture did not neglect the Middle Ages is apparent even to the reader of this chapter who notices how many of the great histories were concerned with that period. There was much difference in the views of the different writers. If Voltaire and the Encyclopedists underestimated the achievements of the Middle Ages, Muratori judged that period justly as being, much more than antiquity, the mother of modern ideas.

Secondly, the rationalist writers have been accused of discarding everything they could not understand, and of assigning rational motives for every act, however little influenced it really may have been by reason. Miracles and legends they rejected *in toto*, not realizing that there is some fact back of the miraculous story, and that a legend sometimes lies less than does a document. In this, of course, they erred, but how humanly, how advantageously! Their fault was but the exaggeration of a great merit; for the senseless credulity of their predecessors they substituted a critical judgment that occasionally, but only occasionally, overshot its mark.

Thirdly, they have been blamed for finding wrong or trivial causes for great events, as when they explained feudalism by the Crusades and the Renaissance by the Turkish conquest of Constantinople. Here, again, we have but the defect of an excellent quality. Their search for general causes was admirable; but it led them sometimes to find causes too hastily.

The most serious charge that can be truthfully brought against the new school of social history is that it disliked hard and thorough work. Persuaded that detail is unnecessary to him who grasps the main line of development, the Voltaireans worked up their facts all too hastily and superficially. Their reliance on secondary works and on inadequate study of the sources failed them most disastrously just in the fields of intellectual and social phenomena that they were the first to cultivate. Political and religious history had been so carefully studied by good authorities that the philosophizers could at least be fairly sure of the

facts; the story of civilization had been left untilled and needed to be cleared, plowed, and sowed by patient labor. Not until Gibbon, did a historian appear who combined the learning of the Maurists with the insight of Voltaire.

It must also be acknowledged by the admirer of the new school that it warped history at times to make it serve propaganda. It is not true, as Carlyle complained, that Voltaire saw nothing in history but a long, tedious debate between the church and the *Encyclopédie*; and, if it were true, this view would be more to our taste than Bossuet's and Carlyle's theory of a divine plan. But it is true that here and there, like most of their predecessors and most of their successors, the historians of the Enlightenment occasionally allowed their bias to distort the picture. All too much they were tempted to see in the past the opposition of priest and philosopher typical of their own age.

Before Voltaire actually began to write the new history, there had been some calls for it. Eminent men, as far back as Bacon, had demanded a history of learning and of culture. Fénelon in 1714 voiced the demand for a history of social phenomena. The Preliminary Discourse of Diderot's *Encyclopédie* declared that "the historical exposition of the order in which our sciences have followed one another will enlighten us and direct us how to transmit the principles of these sciences to our readers." Horace Walpole suggested to Robertson a *History of Learning* as the worthiest occupation for his pen. Samuel Johnson declared: ¹⁸

There is no part of history so generally useful as that which relates to the progress of the human mind, the gradual improvement of reason, the successive advances of science, the vicissitudes of learning and ignorance, the extension and resuscitation of arts, and the revolution of the intellectual world.

Then came Voltaire to supply the needs of the time with two of the most remarkable histories ever written. Their greatness and their defects are largely explained by the author's training—in the Parisian theater and salon, in the

¹⁸ *Rasselas*, 1759, chap. xxx.

London coffee house, in the court of Potsdam, anywhere and everywhere but in the monastery or the study.

François Arouet was born at Paris in 1694 and was educated by the Jesuits. Early determined to make a figure in the fashionable world, he set out to acquire fame and to make "what fools call a fortune," in both of which he succeeded by means of a brilliant pen, an unexampled wit, and not a little impudence. Desiring a name more noble than that of the bourgeois family in which he was born, he assumed the title of "Monsieur de Voltaire," the origin of which has puzzled many of his biographers. Though "Voltaire" is an anagram of "Arouet l[e] j[eune]," and of "revoltai"—"I shocked them"—it was not derived from either of these sources but from an estate at Airvault¹⁹ with which his ancestors had a remote connection.

In those days the path of the social climber was harder than it is today. Nowadays he might have been cut, snubbed, and cold-shouldered; two hundred years ago this determined crasher of noble gates was caned by the footmen of the Duke de Rohan and was twice sent to the Bastille, once for eleven months in 1717-18, and once for five months in 1725. Escaping to England, he spent three years (1726-29) in the society of her best writers, admiring the freedom of her government, the liberalism of her religion, and the triumphs of her science and philosophy. When, protected by the fame of his tragedies, epics, and pamphlets, he returned to France, he was able not only to live safely near Paris with his gifted mistress, Mme. du Châtelet, but he was elected to the Academy and appointed to sundry public offices. Unable to avoid giving offense to the French authorities, he fled a second time, to find at first a warm welcome and then a somewhat irksome servitude at the court of Frederick the Great (1750-53). When the statesman who wanted to be a poet and the poet who wanted to be a statesman could no longer endure each other's pretensions, Voltaire burst out of Prussia amidst a pyrotechnic

¹⁹ See J. O. Wade in *Publications of the Modern Language Association*, xlv, 546 ff. (1929).

discharge of mockery and recrimination both on his side and on the king's. After two years' wandering over Europe, he bought a fine estate at Ferney, near Geneva. Here he spent most of the remaining twenty-three years of his life, deluging Europe with a flood of pamphlets, satires, romances, poems, letters, and histories.

In these latter Voltaire founded a new school. He changed the whole conception of history, not only by freeing it from the chain of traditional authority that had hitherto bound it, but by expanding its subject-matter from a series of anecdotes of camps, councils, and courts, to include the record of, and, as far as possible, the explanation of, the development of nations, their growth and decay, their virtues and vices, their sciences and arts, their laws, customs, manners, opinions, and social arrangements. He himself was quite conscious of the revolution he was effecting, as he explained in a letter of 1757:²⁰

The enlightened spirit now prevalent among the leading nations of Europe requires us to go to the bottom of history, instead of skimming its surface, as earlier writers have done. People now wish to know how a nation grew, the changes in its population, the difference in the number of its soldiers at different times, the nature and growth of its commerce, what arts have sprung up within the country and what have been introduced from elsewhere and perfected there, the changes in the average revenue of the state, the birth and expansion of its navy, the relative numbers of its nobles, clergy, and cultivators of the soil.

All this and more Voltaire gave his readers. No previous historian, and few later ones, can compare with him in width and justness of view, or in freshness and originality of treatment. In some respects his work was unsatisfactory. His criticism, though splendidly free from servility to established authority, was not really scientific. His knowledge of the sources was all too often inadequate. Moreover, he allowed strong prejudices to turn what should have been an

²⁰ *Œuvres*, 1826, lxvi, 61.

objective study into an instrument of propaganda for his ideas. Diderot was quite right in telling him that ²¹

Other historians relate facts to inform us of facts. You relate them in order to arouse in our hearts a profound hatred of lying, superstition, fanaticism, and tyranny; and this anger remains even after the memory of the facts has disappeared.

But what Diderot praised as a merit will be felt by most historians as a defect, and was so felt even then by the judicious:

Voltaire [said Montesquieu] ²² will never write a good history. He is like the monks who do not write for the sake of the subject they treat but for the glory of their order. Voltaire writes for his convent.

Besides several minor works, Voltaire wrote two great histories. The first of these is The Age of Louis XIV, printed at Berlin in 1751 (with the false date, 1752). It is the masterpiece of the new historiography. The author set forth his program in his opening sentence:

It is not only the life of Louis XIV that I propose to write, but a much greater thing. I shall try to paint for posterity not the actions of one man, but the spirit of the men of the most enlightened age of all time.

Discarding the old annalistic method that adhered to a strict and confusing chronology, Voltaire adopted the topical method or, as it was disparagingly called by his critics, the "chest-of-drawers" method. This arrangement did indeed have some inconveniences, as when he treated Colbert's commercial policy after the wars to which it gave rise. But some such defect is inevitable in any possible arrangement. Voltaire's real fault, if any, lay in not making more clear the unity that prevailed throughout the apparent diversity, in not quite apprehending that the same spirit produced the despotic administration, the palace of Versailles, and the classic tragedies.

²¹ *Œuvres*, 1881, xlix, 79; letter of Nov. 28, 1760.

²² Montesquieu: *Œuvres*, vii, 162.

With all its shortcomings the treatment was magnificently catholic. Successive chapters set forth the political history of all Europe, its military history, the loves and other amusements of the Grand Monarch, anecdotes of his court, the internal government of France, its commerce, administration, laws, finance, sciences, arts, superstition, and a survey of the literature of all Europe. The judgment of the author is as cosmopolitan as his choice of subject matter. Corrupted neither by servility nor by patriotism, he judged Louis freely and at times harshly, branding his wars of conquest as unjust, and his bigotry as pernicious.

In a second great work, an *Essay on the Manners and Spirit of the Nations, and on the principal Facts of History from Charlemagne to Louis XIII* (1754) the ideas are even grander and more daring than in the first, but the execution is not so competent. Voltaire had really saturated himself in the literature and sources of the age of Louis XIV. For the much longer period, and for more remote times and nations, he was perforce dependent on secondary works, and therefore to some extent at their mercy. Not that his spirit of criticism and of superior judgment ever slept, but that it could not supply the place of adequate, first-hand erudition. Having tested his use of sources for the period of the Reformation, I have discovered that he relied almost entirely on the works of Bossuet, Sarpi, and De Thou. He worked, that is, with the best French histories available, rarely consulting those in Latin, and still more rarely reading the primary documents.

With all the limitations of the author's learning, his treatment of his materials was marvelous. Like an earlier H. G. Wells, he surveyed history as a whole, in all its departments and in all quarters of the globe, and correlated it with the best scientific and philosophic thought of his time. He first got rid of the old Europo-centric standpoint, surveying mankind from Japan to Peru with equal eyes. He first destroyed the nimbus of sacred and of classical authority. He was capable of suspecting in the old historians the bias that he knew to exist in modern ones. He

first doubted the scandalous gossip related about the Roman emperors by Tacitus and Suetonius. He first asked of every story, is it credible? is it probable? Moreover, he made history realistic. He compared the primitive Christians with the modern Quakers. He made stories of long ago as interesting as those published in yesterday's newspapers. His style, in fact, shining and sputtering like an arc-light, shed a dazzling ray on all subjects and at the same time emitted sparkles of wit, of irony, and of irreverent comment that at once delighted and scandalized his readers.

Though he is commonly credited with coining the phrase "philosophy of history" (which had, in fact, been used by Bodin), he meant by it only history written from the philosophic, that is, the free-thinking standpoint. He contributed little to the understanding of causation. If his rejection of the theological interpretation of Bossuet was a great service, his hatred of Christianity warped his account of it detrimentally. He despised the Middle Ages as the ages of faith; he branded Gothic architecture as "a fantastic compound of rudeness and filigree." He omitted scholasticism entirely. He denounced Catholicism as the most infamous superstition that had ever brutalized man, and the papacy as the worst government ever known. He had little sympathy with the Reformers, mocking their dogmatic subtleties, inveighing against their intolerance, and attributing their revolt to bad and trivial motives, as, for example, the quarrel of the Dominican and Augustinian orders over the right to sell indulgences. In his *Philosophical Dictionary* he speaks of the economic cause of the Reformation, and finds it in the poverty of the northern nations unable to pay the fees demanded by the Catholic clergy. But, whatever may justly be said against the treatment of religion and the mistakes in fact, Voltaire's histories remain a marvelous mixture of genius and sagacity, of luminous exposition, and of bold and original ideas.

Like all successful works, Voltaire's *Essai* soon found imitators. The best of these, in France, was the general history—published in two parts as *Ancient History* and

Modern History—of Condillac. This philosopher introduced an even greater amount of social and intellectual matter than had Voltaire. The progress of thought, manners, and government, the life of the people, their amusements, arts, sciences, dress, meals, baths, roads, business, and manners, supply the bulk of his narrative. Ancient history he ends with the fall of Rome; modern history he begins with the barbarian invasions. He dates the period of progress in science and literature from the Renaissance, and especially from Erasmus, whom he calls "the finest and most enlightened spirit of his century." Much space is given to the progress of the natural sciences from Copernicus to Newton, and much to the perfecting of "the art of reasoning" from Bacon to Locke. The author sums up his philosophy of history in three maxims: The general nature of men is the same everywhere and always; their institutions and manners are modified by climate, government, and the progress of the arts and sciences; accidents bring about many revolutionary changes. After thus stating the general laws of history, the author enunciates its teachings as the demonstration of the need for justice and for obedience to government; and of the duty of the state to promote the happiness to which men are called by nature in preference to all other aims.

Voltaire's legacy of genius for history was divided between two Scotchmen, one of whom, David Hume, appropriated his incisive skepticism and his scorn for Christianity; the other, William Robertson, everything but that. Hume, indeed, was a social philosopher before he knew *The Age of Louis XIV.* When his metaphysics ended in a perfect *cul de sac*, he turned to history to discover what, in the way of ethics and practical wisdom, could be learned from it. As early as 1742 he speculated on general historical laws in an *Essay on the Rise and Progress of the Arts and Sciences*.²³ Anticipating Buckle in discriminating between the incalculable acts of each individual and the predictable average conduct of the masses, he stated that what in social change depends upon a few persons appears to be the result

²³ *Essays*, i, no. 14.

of chance, whereas what arises from the activities of large numbers may be accounted for by determinate and ascertainable causes. The progress of the arts and sciences, he continued, depends partly on the emergence of genius, and is therefore accidental; but in part it depends on social conditions. Freedom, he thought, fosters both art and science, a monarchical form of government being most favorable to art, and a republican form to science. The existence of a number of independent states, connected by commerce and policy, stimulates intellectual advance. When the arts and sciences reach perfection in any nation, from that moment they naturally and necessarily decline, seldom or never to revive on the same soil. If Hume had anticipated Buckle in a previously quoted statement, he clearly adumbrated Oswald Spengler in this last one.

When he came actually to write an extensive *History of England*, which appeared in many volumes from 1754 to 1761, the section treating the Stuarts coming first, that on the Tudors next, and that on the Middle Ages last, he hardly fulfilled the promise of his brilliant essay. Recommending history as "more instructive than ordinary books of amusement and more entertaining than other serious compositions," he wrote partly to divert his readers and partly to inculcate his own anti-clerical and Tory principles. His learning is inadequate, his criticism of sources is very poor. As Macaulay justly complained, "he pleaded the cause of tyranny with the dexterity of an advocate, while affecting the impartiality of a judge."

Far more bitter than his hatred of freedom was his hatred of religion. Though vitiated by prejudice, his history was perhaps a useful antidote to the uncritical panegyrics that had passed for the annals of the church before it. Hume approved the Reformation in so far as it subjected the church to the state, arguing that, as the interested and pernicious diligence of the clergy taught folly, superstition, and delusion, and as the papacy was the most harmful of all ecclesiastical governments, it was expedient to abolish the papal rule and to put the church under the civil power. But this was, in the author's opinion, the only good done by the

Reformation. The offer of the Reformers to submit religious doctrines to private judgment Hume thought a deceptive pretense; for the multitudes, incapable of judging high and intricate matters, were flattered and deluded into believing that they really did decide them. Moreover, the Reformation, while making it easier to execute justice against criminous clerics, did harm by exalting the exponents of doctrine:

These theologians were now of great importance in the world; no poet or philosopher, even in ancient Greece . . . had ever reached equal applause and admiration with those wretched composers of metaphysical polemics.

Less keen, less penetrating, less shining than Hume, William Robertson was his superior in learning, in fairness, in breadth of view, and in painstaking accuracy. The quiet life of Robertson (1721-93) was passed in discharging the duties of a Scotch Presbyterian clergyman, and in writing a series of notable works, of which the chief were *The History of Scotland* (1759), *The History of the Reign of the Emperor Charles V* (1769), and *The History of America* (first edition 1777; revised and enlarged 1794). *The History of Scotland* evinced insight and shrewdness, a Voltairean breadth of view, and an erudition much greater than either Voltaire's or Hume's.

In all respects, except perhaps in style, the *History of Charles V* is the author's masterpiece; and the finest part of that is the analytical introduction on medieval civilization. With the Reformation he was decidedly sympathetic, regarding it as the happy event that had

rescued one-half of Europe from the papal yoke, mitigated its rigor in the other half, and produced a revolution in the sentiments of mankind the greatest, as well as the most beneficial, that has happened since the publication of Christianity.

The chief cause of such a revolution, he said, "historians least prone to credulity and superstition ascribe to Divine Providence." If this relapse to supernaturalism marks

Robertson as inferior to Voltaire and Hume, his careful analysis of the secondary causes through which Providence worked entitles him to rank among the foremost of his contemporaries as a thinker. Among the natural causes of the Reformation he enumerated the Great Schism, the scandalous pontificates of Alexander VI and Julius II, the immorality of the clergy, the wealth of the church, the immunities of priests, the papal taxation, the invention of printing, and the revival of learning. After thus tracing the causes of the Reformation, he described its course with breadth, power of synthesis, real judiciousness, and sympathy.

Two minor works in the school of Voltaire deserve a brief mention. One of them was Robert Henry's (1718-90) *History of England* (1771) on a "new plan," to include "learning, arts, commerce, and manners" as well as political, military, and religious affairs. While Dr. Johnson commended the design of introducing "the history of manners and of common life," Boswell complained that the work was more like a dictionary than a history proper.

The other work is Thomas Hutchinson's *History of the Province of Massachusetts Bay* (three volumes, 1764, 1767, 1828). Hutchinson (1711-80) was the last royal governor of Massachusetts, the son of a wealthy Boston merchant, a graduate of Harvard, an eminent public servant, and a careful student of politics and of chronicles. When the Revolution broke out, his sympathies with the Tory, or British, side, made him the object of attack by the Boston mob, who not only damaged his house and drove him to England, but almost destroyed his invaluable manuscripts. In character and public spirit he was one of the best men of his generation. As a historian he was industrious, judicial, candid, moderate, wide in his sympathies, and particularly happy in his exposition of legal and institutional matters. "The Puritan Hutchinson," says a great historian of our own day, "was in his way a member of the school of Montesquieu, Turgot, and Voltaire—a disciple, consciously or unconsciously, of the *Essai sur les Mœurs*."²⁴

²⁴ J. F. Jameson: *The History of Historical Writing in America*, 79.

CHAPTER VIII

SCHOLARSHIP

I. CLASSICAL SCHOLARSHIP

The Enlightenment, for the first time, subjected antiquity to a skeptical and even hostile scrutiny. The claim of Biblical inspiration and of classical perfection no longer protected the ancient writers from the application of the same critical methods that were used in judging recent writers. The battle of the books showed that a considerable portion of the cultivated public preferred the modern to the ancient poets and orators. In certain quarters burlesques of Virgil, Ovid, Lucian, and Juvenal, representing what had hitherto seemed heroic or sacred as trivial or ludicrous, became popular.

On the other hand, as ideas die hard, and poses still harder, a powerful and numerous party continued to accept as axiomatic the theory of Greek and Roman heroism, and to bow the knee before the Pierian Muses and the Latian Camenæ. Throughout the whole century statesmen posed as Cicero or Cincinnatus, and kings as Cæsar or Augustus; orators tagged their climaxes with Latin verse; essayists prefaced their articles with Greek or Latin apothegms; and poets imitated or paraphrased Pindar or Horace. Like the plays of Corneille in the seventeenth century, Addison's *Cato* in the early eighteenth is one uninterrupted panegyric of Roman virtue:

A Roman soul is bent on higher views:
To civilize the rude, unpolished world,
To lay it under the restraint of laws. . . .
With wisdom, discipline, and liberal arts.¹

¹ *Cato*, 1713, Act i, Scene iv.

Jurists like Leibniz looked to Roman law for instruction in modern legislative reform; political theorists like Montesquieu found in Rome their noblest lessons of policy; critics like Lessing turned to the Laocoön for first principles; poets either proclaimed, with Gray, the superiority of the Æolian lyre, or bade their contemporaries study the rules of art from the classics:

Hear how learn'd Greece her useful rules indites,
When to repress and when indulge our flights.
Learn hence for ancient rules a just esteem;
To copy nature is to copy them.²

The superiority of the ancient to the modern languages continued to be assumed by many writers. As Addison expressed it: ³

If *Paradise Lost* falls short of the *Æneid* or *Iliad*, it proceeds from the fault of the language in which it is written. . . . So divine a poem in English is like a stately palace built of brick, where one may see architecture in as great perfection as in one of marble, though the materials are of coarser nature.

On the other hand there were many who successfully attacked the idolatry of the classics. In addition to the writers who took the modern side in the battle of the books, Voltaire told his contemporaries that Tacitus and Sallust were no more reliable than modern journalists and that Tasso surpassed Homer in sublimity and beauty. Lessing took the balanced view that ancients and moderns are equally great, Homer and Newton being supreme each in his own sphere.⁴

As a common literary language Latin lost ground rather rapidly after the end of the seventeenth century. After Milton very few poets wrote Latin verse. Those who did so were compared by Jean Le Clerc, a famous linguist, to monkeys imitating men, for they succeeded only in appropriating their bad qualities but not their good ones. New-

² Pope: *Essay on Criticism*.

³ *Spectator*, no. 417, 1712.

⁴ *Poem to Herr M—*, Lessing: *Werke*, vii, 9.

ton, Huygens, and Leibniz were the last great scientists to publish much in the learned tongue, and even they frequently employed the vernaculars. In fact the decay of Latin so alarmed the conservatives that Maupertuis begged Frederick the Great to found a city in which that language only should be spoken. Though it continued to be taught thoroughly and to the exclusion of modern tongues in the schools, it was no longer regarded as necessary to a gentleman in the great world. Doubtless the common opinion was that put by Fielding—ironically, of course—in the mouth of Mrs. Slipslop, the housekeeper:

Why is Latin more necessitous for a gentleman than a footman? It is very proper that you clergymen must learn it, because you can't preach without it: but I have heard gentlemen in London say that it is fit for nobody else.

Even when the classics were taught and even where the love of them was cherished or affected they were not, in the opinion of good judges, well understood. Gibbon's first work, a French *Essay on the Study of Literature*, complained that language only was mastered and that the content of the ancient writers was misunderstood because of the prevalent ignorance of antiquity. While the passion for collecting ancient coins, statues, and vases might seem to testify to the continued interest in the ancients, the habit of regarding such "antiquities" merely as curiosities greatly hurt the progress of real philology and archeology.

In the face of popular dislike and of dilettante love, a new school of devoted students added considerably to the historical, literary, and artistic criticism of the ancients. The first of these men was Richard Bentley (1662-1742) an English university professor whose first publication, an edition of an appendix to the *Chronicle* of John Malalas evinced a deep knowledge of Greek grammar and prosody, a marked faculty for textual emendation, and a large erudition. His masterpiece, the *Dissertation upon the Epistles of Phalaris* (1699), not only played an important part in the battle of the books but proved to be a great critical achievement.

A wide knowledge of Greek history and an unrivaled mastery of the evolution of Greek style allowed Bentley to point out the anachronisms in this famous forgery so convincingly that no reputable scholar has defended it since. Among his other discoveries the one that attracted the most attention at the time was that of the Greek digamma, a letter written like a capital F, and pronounced in Homer's time like the Latin *v* or the English *w*, but lost by the age of Pericles and hence not represented in the extant copies of the early epics. Appreciating its importance both for etymology and for scansion, Bentley reintroduced the letter in his edition of Homer of 1732-34.

Less capable of understanding poetry than grammar, Bentley was not happy in an edition of Horace (1711) that offered about 750 new readings; still less successful was he in an equally laborious edition of Milton. It was probably of the Horace that Addison was thinking when he complained:

I have been very often disappointed of late years, when examining a new edition of a classic author, I have found over half the volume taken up with various readings.⁵

The same disparagement of overloaded critical apparatus is voiced by Lessing in the following epigram:

Cupid and Liber have taught me more
Of Horace than ten Bentleys' lore.⁶

Such editors are ridiculed in Henry Fielding's play *Tom Thumb the Great* (1731), a burlesque tragedy mocking the pompous style of current plays in its text, and the pedantic critics in its notes. Preposterous emendations of simple words are proposed and assigned to the better-known editors of the day; for example, for "Thomas Thumb," Dr. Bentley is made to read "Tall-mast Thumb," and other critics, "thumping Thumb," and "thundering Thumb."

⁵ *Spectator*, no. 470 (1712).

⁶ Lessing's *Werke*, i, 67.

Pope also pilloried Bentley in the *Dunciad* (1728) as "Aristarchus,"

The mighty scholiast, whose unwearied pains
Made Horace dull, and humbled Milton's strains.
Turn what they will to verse, their toil is vain,
Critics like me shall make it prose again.
Roman and Greek grammarians! know your better,—
Author of something yet more great than letter;
While towering o'er your alphabet, like Saul,
Stands our digamma and o'ertops them all.
'Tis true, on words is still our whole debate,
Disputes of *me* or *te*, or *aut*, or *at*,
To sound or sink in *cano*, O or A,
Or give up Cicero to C or K.

It is hardly worth while, in a history of general culture, to do more than mention the names of a few of the other great scholars of the age. J. A. Fabricius (1668-1736) published a *Bibliotheca Græca* (14 volumes, 1705-28) that laid the foundation for all subsequent histories of Greek literature. Bernard de Montfaucon (1657-1741) wrote, under the title of *Antiquité Expliquée* a treasury of classical antiquities (10 volumes, 1719, with five supplements).

Of those who, at this period, turned their attention to ancient history, Montesquieu in a treatise on *The Causes of the Greatness and Decadence of the Romans* (1734) set out to show, by an examination of an old and well-known state, that "there are general causes, moral or physical, that operate in every monarchy to raise, to sustain, and then to subvert it." The forces that made the Romans masters of the world he found in their institutions and history. One cause of their strength was their readiness to adopt the good customs of other peoples. Another was the emergence, in their early history, of a series of great kings, for, "in the birth of societies it is the chiefs of the state that make the constitution; afterwards it is the constitution that forms the chiefs of the state." A third factor in the strength of Rome was the sound basis of society in a class of free

landowners, or farmers, from whom the army could be recruited. The later consolidation of the small farms into large estates sapped the sources of military strength. The fourth element in Roman conquest was the wise policy of the Senate in rewarding allies and punishing enemies, in setting nation against nation and party against party among their foes, so as to profit by this dissension, and in financially ruining hostile states.

The chief causes of the decline and fall of the Roman Empire Montesquieu found, first, in the vast extent of the conquests by which the provinces lost touch with the capital and the armies on the frontier forgot all allegiance except to their own generals; secondly, in the influx of aliens who corrupted the suffrage of the city; and thirdly, in the corruption of morals by the epicurean philosophy, by the collapse of religion, and by the accumulation of wealth. In addition to these causes, Montesquieu mentioned three others of a more accidental nature: first, that Rome, which had conquered the nations one by one, was attacked by many nations all at once; secondly, that the Christian religion sapped military and civic virtues; and thirdly, that the division of the Empire into Eastern and Western halves weakened it. And of these halves, the Eastern survived the Western by a thousand years because of its commerce, of the invention of Greek fire, and of the aid given it by the crusaders.

If the author of this grandiose essay was influenced by the desire to find practical lessons for his own country, and if he was oriented by a marked wish to refute Bossuet on the one hand and Machiavelli on the other, he nevertheless erected so solid a fabric that its design was in the main adopted by many later historians, including Gibbon.

2. BIBLICAL CRITICISM

A new era in the criticism of both the Old and the New Testament began with the Enlightenment. While a French physician discovered the key to the analysis of the sources

of the Pentateuch, English and German Deists reconstructed on a sounder basis the story of Christian origins.

Comparatively little advance was made in the textual criticism of the sacred books. In an *Essay towards restoring the true Text of the Old Testament* (1722) W. Whiston showed that the Hebrew text had been falsified in some instances, and tried to restore it by comparison with the Septuagint and Samaritan versions, and by the quotations found in the New Testament, Philo, Josephus, and the Fathers.

An excellent essay in the textual criticism of the New Testament came from the pen of Sir Isaac Newton, whose *Historical Account of Two Notable Corruptions of Scriptures* was first published (1754) long after his death and then in an imperfect form. By a careful examination of the manuscripts and of printed editions he showed, more fully than even Erasmus had done before him, that the verse I John V, 7, is a late interpolation, and that the substitution of the word "God" for the word "he who" in I Timothy III, 16, is unsupported by good authority. In these assertions he was undoubtedly right; though he was perhaps too daring in attributing the first corruption to the Montanists and the second to the Nestorians. His labors met with little recognition because they attacked proof-texts of the doctrine of the Trinity, and were perhaps really animated by Newton's own Socinian, or Deistic, opinions.

In fact, from the days of Jerome to those of the English Revised Version of 1880, every alteration in the received text of the Scriptures has been fought by conservatives and hailed by radicals as an attack on inspiration. In 1716 Bentley wrote Archdeacon Hare:

an alarm has been made of late years with the vast heap of various lections found in the manuscripts of the Greek Testament. The papists have made great use of them against the Protestants, and the atheists against both.⁷

⁷ *Works*, iii, 477.

He therefore proposed a new edition of the Greek text as it existed at the time of the Council of Nicæa, "so that there shall not be twenty words' or even particles' difference." To effect this he relied on the *Codex Alexandrinus* at London and on a Paris palimpsest; but his work in collating manuscripts was in fact extremely poor.

More successful in this respect was Johann Albrecht Bengel (1687-1752) who published the New Testament in the original in 1734. His maxim that "the more difficult reading is to be preferred to the easier one" has commended itself to scholars, and his classification of manuscripts into families, according to their provenance, has found many imitators.

During the last years of the seventeenth and the first half of the eighteenth century the higher criticism of the Old Testament slumbered in dogmatic orthodoxy or in fantastic dreams. Much time was wasted in chasing those wild geese, the dates of creation and of the deluge, and much in reading the recent and future history of the world in the dark oracles of Daniel and the Apocalypse. It is remarkable that Newton, with his scientific genius and with his liberal views of the doctrine of the Trinity, should have lost himself in both these labyrinths. One thinks of the scientists of our own generation who have endorsed spiritualism and other superstitions. In a tract called *Observations upon the Prophecies of Daniel and the Apocalypse of St. John* (posthumously published in 1733), Newton tried to apply these prophecies to the history of the world since they were uttered. For example, in the ten horns of the fourth beast described by Daniel he found the ten kingdoms of the barbarian invaders of the Roman Empire, namely, the Vandals, the Suevi, the Visigoths, the Alans, the Burgundians, the Franks, the Britons, the Huns, the Lombards, and the Ostrogoths of Ravenna.

Not much more successful was his tract on the *Chronologies of the Ancient Kingdoms*. He did not come much closer than had his predecessors to determining authentic dates, and he apparently reduced the age of the world, as

calculated by Usher, by five hundred years. So many other scholars labored in this hopeless branch of Biblical chronology that by 1738 one of them, De Vignolles, declared that he had gathered two hundred computations of the date of the creation of the world as described in Genesis, and that no two of them agreed. Most of them, however, fluctuated around the date of Usher, 4004 B.C. Astruc and Vico accepted, Euler defended, and Montesquieu,⁸ against his better judgment, admitted the commonly received date.

But there were certain thinkers who maintained a much greater age of the world either on the ground of other histories than the Jewish, or on geological science. Gildon showed that Egyptian chronology went back 13,000 years, that the Chinese computed the age of their civilization at 90,000 years or more, and that the Indian Brahmins asserted that the world had lived 326,669 ages, each age containing many centuries.⁹ The Deist, Charles Blount, argued from these traditions and also from astronomy, that the world could not possibly have been created so short a time as 6,000 years ago. The scientist Buffon calculated the age of the world at 70,000 or 75,000 years.

Returning from these digressions to the higher criticism of the Old Testament, we find a remarkable performance in *The Literal Scheme of Prophecy considered*, published by the English Deist, Anthony Collins, in 1727. On the rational axiom that so-called prophecies, so far as they are specific, must have been uttered after and not before the events described, Collins showed that the author of the book of Daniel knew the history of the Jews until the time of Antiochus Epiphanes, but not later; and he argued from this that the author of the book must therefore have lived at this time and not in the far earlier reign of Nebuchadnezzar. The demonstration, original except for a hint found in Porphyry, has satisfied modern critics.

⁸ "The origin of the world is proved only by the Scriptures; for, the historic proofs are all against the received system." Montesquieu: *Pensées et Fragments inédits*, ii, 197.

⁹ Letter of C. Gildon to Blount, in Blount's *Works*, 184.

More orthodox in tone, but not less sound in principle, were the *Academic Lectures on Sacred Hebrew Poetry*, published by Bishop Robert Lowth in Latin in 1753, and translated into English in 1787. Treating the Bible as literature, he laid down the following excellent rule:

It is the first duty of the critic to remark, so far as possible, the situation and habits of the author, the natural history of his country, and the scene of the poem.

In this same year, 1753, a very remarkable work was published anonymously at Brussels under a French title meaning *Conjectures on the Original Memoirs which Moses appears to have used in composing the Book of Genesis*. The author was Jean Astruc, already known to my readers as a physician and writer on medical subjects. His hobby being Biblical criticism, he read the Old Testament in Hebrew, in the Vulgate, and in the various French versions of which he esteemed the Protestant Geneva translation of 1610 the best, though he was a pious Catholic. He also read the commentators, among them Usher and Simon, and Spinoza, and perhaps other free thinkers who were attacking the scriptural account of creation on the ground that Moses could not have known much of events that happened twenty-four centuries before his time, and were asking what materials he had before him when he wrote the book of Genesis, and how they could have been so circumstantial, fresh, and authentic.¹⁰

Pondering these questions, Astruc turned to the original record for an answer and soon came to believe that

Moses had in his hands ancient memoirs containing the history of his ancestors since the creation of the world, and that, in order not to omit anything in these documents he cut them into pieces, arranged them topically according to the facts treated, and then put these pieces whole in his narrative, one after the other, and thus formed the book of Genesis from this compilation.¹¹

¹⁰ Bolingbroke: *Works*, v, 24. This letter could hardly have been known to Astruc, but it represents the general tone of skeptical thought in the years when he wrote.

¹¹ *Conjectures*, 9.

In distinguishing these sources Astruc, in a flash of genius, found the key that fitted. In some parts of Genesis the Deity is called Elohim (in our version, God) and in other parts Jehovah (in our version, the Lord). If the narrative is analyzed into two principal sources according to the use of these words, each document will be found to have internal unity, and the numerous repetitions now found in Genesis will be explained. There are a few passages, however, which do not fit readily into either document, and these Astruc assigned to ten minor sources which he supposed Moses had collected from the archives of his own and neighboring peoples.

The real value of Astruc's achievement is that he discovered the method of analyzing ancient documents into their sources by stylistic marks, a method enormously fruitful in the hands of modern critics. His main conclusions as to the sources of Genesis have likewise been universally approved. Every Biblical scholar now accepts the theory of the two main sources of Genesis distinguished by the use of Elohim and Jehovah as the names for God. But as no competent scholar now accepts the Mosaic authorship of the Pentateuch, none can agree with Astruc's attempts to identify the provenance of the sources. Astruc would have seen in the Elohim document an old family chronicle handed down to Moses through his father Amram and his grandfather Levi; and in the Jehovah document he would fain recognize the memoirs of an ancient patriarch. Nevertheless, because he is "the father of the documentary hypothesis" Astruc is now acclaimed as the founder of modern Biblical criticism. From his contemporaries he received little notice, and that little unfavorable.

The modern higher criticism of the New Testament was founded by English and German Deists in the course of their attack on the orthodox view of the supernatural origin of Christianity. No purely historical interest could have induced Christians to apply rational criticism of the sacred books in any point vital to their faith. The serious investigation of the external evidences of Christianity contained

in the Gospels did not come until the foundations of belief had been sapped by philosophers. If a dogmatic interest precluded the orthodox exegetes from impartial examination of their sacred books, it was no less a dogmatic interest that impelled the Deists to attack them. History can never be written in absolute objectivity; it is necessarily conditioned by philosophical presuppositions. To the believers in the creeds the miracles related in the Bible seemed probable *a priori*; to the rejecters of the faith, these same miracles seemed impossible. The merit of the Deistic criticism of the Gospels is not that it was colorless and free from dogmatic bias, but that it was inspired by a new philosophy derived from natural science, more apt to discover new truth in the ancient documents than the outworn philosophy of the apologists could do. It substituted a natural for a supernatural view, and a historical for an apologetical interest. The criticism of the Bible, however, was so deeply involved in and conditioned by the larger questions of Christian evidences, that it is best treated in a future chapter (XIV) devoted to Free Thought.

A new and valuable principle of exegesis was advanced by John Locke in his *Essay for the Understanding of St. Paul's Epistles* (1705). Earlier interpreters had assumed a perfect harmony and unity of doctrine in all the books of the Bible, or at least, among all the books of the New Testament. Locke distinguished between the Epistles on the one hand and the Gospels and Acts of the Apostles on the other, by showing that they represent different strata of development.

While Locke and the English Deists were feeling the way to a better critical method, a German professor of oriental languages at Hamburg, wholly unknown to his own generation, was laying the foundations for that stupendous task of nineteenth-century learning, the quest of the historical Jesus. Earlier generations had wanted only the theological Christ, the God-Man of the creeds and of the philosophers; recent scholars have sought chiefly the real man who lived in Palestine in the age of Tiberius. The first to seek, and

partly to find, this human person, was Hermann Samuel Reimarus (1694-1768). As a Deist he wrote a voluminous manuscript to advance his creed, a manuscript so far ahead of the thought of his own generation that he could get no publisher for it. It contained many sections, some on the philosophy of Deism, and some on Biblical criticism. Of these chapters seven were published by Lessing (1774-78) under the title of *Fragments of an Anonymous Work found at Wolfenbüttel*. Of these seven fragments four were on Biblical criticism, with the following subjects: 1. The Passing of the Israelites through the Red Sea—a witty exposure of all the impossibilities of that narrative. 2. Showing that the Books of the Old Testament were not written to reveal a Religion. 3. The Story of the Resurrection. 4. The Aims of Jesus and his Disciples.

The purpose of the writer was to separate the accidental, or adventitious portions of the Bible from the moral core which might be regarded as philosophically identical with natural religion. In the course of his exposition, while rejecting miracles with the usual arguments, he comes nearer than anyone had yet done, or tried to do, to painting an accurate picture of the human Jesus. He saw clearly that Jesus had not the slightest intention of abolishing the Jewish religion and setting up another in its place, that he taught only moral duties, that he lived in an eschatological world expecting its speedy end, that his preaching of the kingdom of heaven must be interpreted as referring to a temporal, political empire of the Jews. What really started Christianity as a new and conquering religion was the frustration of the disciples' hopes at the death of their master, and their consequent remodeling of his message in terms of a spiritual kingdom. This was far from the whole truth, but it was the most important contribution yet made to a truly historical view of the New Testament.

CHAPTER IX

THE MODERN PROSE STYLE

I. THE INFLUENCE OF SCIENCE AND OF POPULAR EDUCATION ON LITERATURE

That great intellectual revolution known as the Enlightenment was distinguished no less by the energy of its leaders in propagating than by their fertility in creating thought. The new world-picture painted by the seventeenth century and then seen by only a small class, was diffused among a wide public by the eighteenth century. The seminal principles propounded by the scientists had to be thoroughly assimilated and applied to all other fields of thought; they had also to be made the common property of an ever enlarging public of curious and interested readers. This process was accomplished partly by conscious missionary effort of the apostles of reason, partly by the unintentional communication of the new thought by those who were unwittingly infected by it, and partly by the enemies of revolution who, in combating, advertised it. The literature of the eighteenth century may therefore be regarded, from one point of view, as a vast engine for the diffusion of the new ideas. For this end it created new forms and animated them with a new spirit. The chief writers were infected with the virus of science, and were stimulated by the emergence of a large reading public hungry for thought and information.

From the purely literary standpoint the prime achievement of the age was the creation of a new prose style. Though there was also a new poetry and a new drama, it was in the prose of journal, essay, treatise, and novel, that the fresh thought found its most perfect incarnation. Since the rise of the vernaculars the European races had hitherto,

like M. Jourdain in Molière's comedy, spoken prose without knowing it. Now they became acutely conscious of it, and of the inadequacy of their former speech to express their meaning. The written languages lacked precision to define ideas accurately; they lacked clarity and perspicuity to convey those ideas to the general public. In the seventeenth and earlier centuries vernacular prose, when not neglected altogether for Latin, had been either modeled on Latin—cumbrous, majestic, and rhetorical—or had been assimilated to poetry—emotional, fanciful, and turgid. What it lacked and what was urgently demanded of it was clarity, lucidity, and the exactness of science coupled with the comprehensibility of well-bred conversation. Style must be made correct, that is, consonant with reason, and witty, that is, interesting to the common man.

The two forces that, beyond all others, have formed the language and literature of modern times, have been science and democracy. A vast, though mostly unobserved, influence has been that of science. Among the few men of the late seventeenth century who noticed this, Fontenelle thus commented on it:

The order, the neatness, the precision, the exactness prevailing in good books for some time may well have arisen in that geometrical spirit now more widespread than ever. . . . A work on ethics, politics, or criticism, perhaps even a work of eloquence will be finer, other things being equal, if it is done by the hand of a geometrician.

In England Thomas Sprat, the first historian of the Royal Society, recorded that the Fellows resolved

to reject all the amplifications, digressions, and swellings of style. . . . They have exacted from their members a close, naked, natural way of speaking; positive expressions, clear senses, a native easiness; bringing all things as near the mathematical plainness as they can; and preferring the language of artisans, countrymen, and merchants before that of wits and scholars.

So diligently did the members of this society observe these precepts that within a decade of the foundation of the

Transactions of the Royal Society the average length of the sentences used in that periodical had been cut in half. Among the first masters of the new English was Dr. John Wilkins, the inventor of the Real Character, whose short, pointed, and exact sentences retained little or nothing of the redundant languor of those penned by his contemporaries. Newton wrote this style in its purest form; in his familiar letters as in his labored treatises everything is exactly defined and expounded with mathematical logic. In fact, it is too austere for human frailty; it is like oxygen, too pure to breathe by itself, or like those foods too refined of all but nourishment to be digested.

In France the influence of Descartes and that of the *Académie des Sciences* performed a like service for the native language. One of the first great masters of the new French style was the foreigner Huygens, whose prose Chapelain found "so pure and so easy as cannot commonly be found even among Frenchmen."¹

Galileo created the modern Italian style. In clarity, in humor, in popular dialogue and in closely reasoned exposition, he wrote an Italian unmatched from Machiavelli to Manzoni. Indeed, it was a better style, according to most tastes, than that of Newton or of Descartes, in that it mingled its scientific element with an artistic, and sometimes with a baroque ingredient.

Even the minor dialects began to rectify themselves by scientific standards. Simon Stevin, the Dutch engineer and mathematician, praises his native Flemish for its lucidity and power of adapting itself to scientific, as well as to emotional, uses.²

More powerful in moulding the modern style than science was democracy—the growth in numbers, that is, of the reading public. Ever since the invention of typography in Europe, the press had been reckoned the chief avenue to knowledge and the prime instrument for appealing to public opinion. In its first age almost all writers extolled that which

¹ *Œuvres de Huygens*, i, 397 (1656).

² *Biographie Nationale*, xxiii, 906.

so multiplied their own works; and even in the seventeenth century, when printing had become commonplace, a thinking mind, like that of Galileo, esteemed as the most stupendous of all inventions that which enabled a man to speak to millions from afar, and even to generations unborn.³

It was not long, however, before the multiplication of books was felt as an oppression and a bewilderment. When Barrildo, a peasant in Lope de Vega's play *Fonte Ovejuna*, remarks that "since so many books have been printed learning spreads," Leonelo, a student, replies:

You ought rather to say un-learning spreads; for a too great swarm of objects confuses the mind, and should not one dread the task of reading only the titles of all the books? I will not deny the art of printing the merit of having saved the works of the spirit from the ravages of time, I admit that Gutenberg of Mainz, who first invented it, has won immortal fame and claims our gratitude. But think how many dunces become famous authors by the ease with which they can publish their foolishness!

In similar vein Sir Thomas Browne complains:

There be too many books in the world. . . . Pineda quotes more authors in one work than are necessary in the whole world. . . . [There should be] a general synod, not to unite the incompatible difference of religion, but for the benefit of learning, to reduce it, as it lay at first, in a few and solid authors; and to condemn to the fire those swarms and millions of rhapsodies begotten only to distract and abuse the weaker judgment of scholars, and to maintain the trade and mystery of typographers.

A more judicious and discriminating estimate of books is found in Francis Bacon's essay "Of Studies":

Some books [says this wise man] are to be tasted; others to be swallowed, and some few to be chewed and digested. . . . Reading maketh a full man; conference a ready man; and writing an exact man. . . . Histories make men wise; poets, witty; the mathematics, subtle; natural philosophy, deep; moral, grave; logic and rhetoric, able to contend.

³ Galileo: *Opere*, vii, 130 (1632).

If Bacon's library included all sorts of books, men of less catholic minds more rigidly excluded all but those approved by their own special interests. Leibniz esteemed only two sorts of books useful, those containing experiments and demonstrations and those containing political and historical documents. And harsh words expressing supreme contempt for medieval and especially scholastic literature abounded in the age of reason.

While the philosopher and critic pronounced nice, or sweeping, judgments of the qualities of the several branches of literature, the reading public, interested in all sorts of print, continued steadily to grow. From the day when Gutenberg's Bible issued from his press until the present, the reading class has become larger and larger until, in many countries, it now comprises almost the whole population. Even more than the rise of science the rise of the reading public has moulded literature. As the literate class expands it takes in lower and lower levels of intelligence and taste. The democratization of literature has meant also its vulgarization. The masses want books and newspapers that reflect their own simple interests, pander to their own crude tastes, and flatter their own low prejudices. Above all, they have demanded simplicity and comprehensibility. Perspicuity and interest became the chief virtues of a style that appealed to persons who would read nothing not easily understood, and nothing not invested with an immediate appeal.

The growth of the demand for books and periodicals and the increased profits of the publishing trade completely changed the position of the author. Before the eighteenth century no writer made a great fortune from the sale of his books. Shakespeare became rich as an actor and manager, not as an author. Milton lived on private means and public office while he received insignificant sums from his writings. Luther, the sale of whose pamphlets was enormous, lived on his modest salary as a professor. Erasmus was made comfortable by the pensions and presents of the great. Tasso was a parasite, Rabelais a vagabond, a physician, and

proof-reader by turns, Cervantes a soldier, Molière a petty officer of a king, while their less fortunate fellows starved.

The poet, the historian, and the novelist could hardly live except as clients to the rich and great. Patronage had been the feeder and the master of the muses. Most patrons were private men trying to buy immortality at bargain rates, or keeping a writer as they would a race-horse, to be an elegant ornament and an amusing toy. Occasionally the government of some state would pension eminent authors. Public patronage of literature reached its height in England under Anne. Among those given pensions or places by her ministers were Newton, Locke, Addison, Swift, Steele, Defoe, Prior, Gay, Rowe, Congreve, and a host of minor scribblers. Even Pope, disqualified by religion from receiving government aid, was offered a secret pension. Louis XIV gave appointments and pensions to many writers. Frederick the Great and Catherine II of Russia, however, while generously fostering science, gave little or no help to the cultivators of fair letters.

In fact, after the death of Louis XIV and of Anne, government patronage of literature almost ceased, and the miserable writer was thrown on a public from whom he could not collect an adequate wage. Steele ended his life in poverty and neglect; Savage walked the streets of London for want of a lodging; Johnson spent some years in penury and neglect; and Goldsmith more than once saw the interior of a debtor's prison. And of the smaller fry, the literary hack and even the talented poet or pamphleteer led a wretched life in the attics of Grub Street, or in prison for debt, supporting himself while there by writing, at fifteen shillings a day, for some magazine articles "all about liberty and freedom and the constitution of England."⁴

This unhappy situation was remedied by the copyright acts which for the first time allowed the author to profit adequately by the sale of his own works. Though monopolies and privileges for the sole printing of a work had been given occasionally before the eighteenth century, they had

⁴ Fielding: *Amelia*, ii, 169.

been worth little in effective protection of the author's rights. In 1710 the first general copyright law was passed in England, granting the author the sole right to publish his works for a period of fourteen years, and if he wished to renew the privilege, for a second period of the same length. For the next sixty years authors made efforts to establish a right in their literary property in perpetuity, but failed to do so. Nevertheless, this law, for England at least, proved a handsome endowment to popular writers. The continent of Europe lagged behind Great Britain, not enacting similar laws for nearly a century. Various devices of printers and special favors of the great enabled some authors, at least, to make money even on the continent. But the rewards of literature were still precarious. A financial genius, like Voltaire, made a great fortune as much from speculation as from his pen; the almost equally popular Rousseau languished in squalid poverty most of the time.

After the middle of the eighteenth century the general public was the most munificent patron of the writer. The private patron became at first superfluous and then odious. Among the many English writers who, at this time, rejected officious offers of patronage with contumely, perhaps Samuel Johnson best voiced the attitude of the profession in the preface to his *Dictionary*, a letter to Lord Chesterfield:

Is not a patron, my lord, one who looks with unconcern on a man struggling for life in the water, and when he has reached ground, encumbers him with help? . . . I hope it is no very cynical asperity not to confess obligations where no benefit has been received; or to be unwilling that the public should consider me as owing that to a patron which Providence has enabled me to do for myself.

2. NEWSPAPERS AND MAGAZINES

The revolution that turned the Republic of Letters from an oligarchy into a democracy was marked by the rise of the periodical press. To a much greater extent than is usually allowed, the history of modern literatures is the

history of journalism. Because of its cheapness, its timeliness, its readability and brevity, the periodical has become the chief reading-matter of the general public. More and more the journal encroaches on the book; more and more it penetrates every corner of literature and caters to the interest of every class; more and more it has imposed its style on the whole profession of letters.

First came the newspaper, the sheet devoted to the dissemination of intelligence of timely interest in politics and in other spheres. These papers arose in Germany, where the art of printing was invented and where the appetite for news was greatly stimulated by the battle over the Reformation, fought as that was in the press, like a modern election. From an early date the governments had necessarily collected news from the reports of their agents. Then came the bankers and industrialists who found their profit in gathering the latest information of happenings throughout the world. These reports, generally kept secret, were remarkably full of authentic news and of less trustworthy rumor and gossip on every phase of public life.

The common man's demand for news was supplied by pamphlets, broadsides, and woodcuts, each usually devoted to some one topic, such as a battle, or an earthquake, or a festivity. In Germany these pamphlets, called *Zeitungen* (Tidings), covered a remarkably wide field of interest, and became, in the sixteenth century, very numerous. Most of them resembled a news story in a modern paper. Some of them appealed to the public by argument, like the modern editorial. Some were caricatures or satires, and some were verses of serious or burlesque intent. The writers were sometimes news-gatherers paid by a publisher; sometimes hacks in the pay of a government; sometimes the leading authors of the day. Luther himself wrote one such *Zeitung*, or *News from the Rhine*, to ridicule the Archbishop of Mainz's collection of relics which, the author averred, contained such spurious articles as "two feathers and an egg of the Holy Ghost," and "a fair piece of Moses' left horn." A whole series of caricatures, including woodcuts and verses,

was issued during the course of the Thirty Years' War to influence public opinion against the Winter King of Bohemia.

Early in the seventeenth century these *Zeitungen* began to take on the character of the modern newspaper, being issued regularly at frequent intervals and expanding their table of contents to include several subjects in each issue as the course of events suggested them. The two first of these were both issued in 1609. The first was probably the *Avisa, Relation, oder Zeitung*, published at Augsburg weekly during 1609 and 1610. The second was the *Relation aller fürnehmen und gedenkwürdigen Historien*, which began to be published at Strassburg in 1609. After this, numerous papers were started in other cities, three in Frankfort before 1621, and thereafter in Magdeburg, Augsburg, Cologne, Leipzig, and other cities. While these were devoted to politics, others were started before the end of the century to cover other fields. Leibniz planned a literary review, to be called the *Nucleus librarius semestralis*, to notice new books and to catalogue old ones in convenient bibliographies. In the next century moralistic weekly papers began to imitate Addison's *Spectator*, soon after that model had proved its success. Other journals, appealing to special classes, followed hard upon these. Among them was a woman's paper, published at Leipzig in 1725-26, under the slightly ironical title of *The Reasonable Fault-finders* (*Die vernünftigen Tadlerinnen*).

Not in Germany but in England did the periodical press first reach its full maturity. Political freedom allowed, an active intellectual life encouraged, and a general prosperity nourished a more luxuriant growth of newspapers and magazines in England than was possible in a land ravaged by war and fettered by despotism. Under the Tudors the British public had been supplied with news irregularly by pamphlets, broadsides, ballads, letters, and proclamations. The outbreak of the Thirty Years' War in 1618 created so much interest in foreign affairs that very soon thereafter we hear of sheets "printed every week at least with all manner of news and strange stuff." One of the earliest of these

"corantos," dated December 2, 1620, has survived. But the first regular weekly papers to be published in London were: 1. *Weekly News from Italy, Germany, Hungary, Bohemia, the Palatinate, France and the Low Countries, translated out of the Low Dutch Copy. Printed by I. D. for Nicholas Bourne and Thomas Archer*, first appearing in May, 1622; and 2. *Weekly News from Most Parts of Christendom, by Nathaniel Butter*, first published in September, 1622. Even before these had begun, the government had issued a proclamation (July 24, 1621) directed at the irregular news-letters, "against lavish and licentious talking in matters of state either at home or abroad." In 1620 Ben Jonson, in his *News from the New World discovered in the Moon*, satirized the writers of these sheets. He makes one of them say:

I do write my thousand letters a week, ordinary, sometimes twelve hundred. . . . I have friends [*i.e.*, subscribers] of all ranks and of all religions, for which I keep an answering catalogue of dispatches, wherein I have my Puritan news, my Protestant [*i.e.*, Anglican] news, and my pontifical [*i.e.*, Catholic] news.

The same playwright produced a more elaborate satire on the press in his *Staple of the News* (1626), in which he pilloried the credulous curiosity of the public and the venality of the editors. "Pecunia" is the heroine and "Mortgage" her nurse. Another slap at the press is found in William Rowley's *A Match at Midnight* (1622) which speaks sarcastically of the little truth to be found "in all the weekly news we buy for our penny."

After tolerating the newspapers for ten years the Star Chamber, in 1632, prohibited the printing of all news from foreign parts, so that for six years no regular papers appeared. In 1638, however, Butter and Bourne got royal letters patent giving them a monopoly of printing foreign news. Difficulties with the licensers caused a second suppression of the Corantos (as they were then called) until 1641, when the Parliament permitted "Diurnals" reporting its proceedings and other items of news to be printed. A

great flock of these forthwith issued from the press, no less than 59 being known for the year 1642.

The course of the civil war generally stimulated and occasionally interrupted the growth of the newspaper press. Among the great journalists of the time was John Dillingham, the son of a parson, himself bred as a tailor. In 1643 he began to publish *The Parliament Scout* every Thursday. When this was suppressed in 1645 for free comment on the Parliamentary debates, Dillingham joined the staff of *Le Mercure Anglois*, a weekly newspaper intended to give Europe news of the island kingdom. When in 1646 the Commons passed an order limiting the liberty of the press, Dillingham commented, "the printers being frightened the diurnals cease, which though it is a trouble to me, is yet a joy,"—meaning that his private news-letters would be more bought.

Appreciating the need of a paper to present its own case to the public, in 1650 the Council of State of the Commonwealth hired a venal journalist, Marchamont Needham, hitherto a Royalist, to edit a weekly with Republican politics. After a few months, John Milton was made licenser and supervising editor of this sheet. Beginning in June, 1650, it appeared for ten years under the title *Mercurius Politicus, comprising the Sum of all Intelligence, with the affairs and designs now on Foot in the Three Nations of England, Ireland, and Scotland. In defence of the Commonwealth and for the Information of the People*. Each number, in sixteen octavo pages, contains summaries of news and a leading article, or editorial, on political and religious matters. How many of these were written by Milton would be an interesting inquiry. After reading a number of them carefully, I conclude that the subjects of many of them were suggested by him, but that they were not written by him. His favorite topics are treated in a lower style than his.

Among the other numerous papers printed during the civil war and Commonwealth were the Royalist *Mercurius Aulicus* (1642-44) and the *Mercurius Civicus*, the first paper to be illustrated with woodcuts (1643).

Though poorly written, these news sheets enjoyed immense popularity. As Dillingham wrote: "The age is so desperate an adorer of novelties that it embraces news in any language or under any color. Every man hath his peculiar fancy, and if it be tickled, no matter where truth lie." Needham, in the second issue of the *Mercurius Politicus*, boasted that fine gentlemen buy him because of his wit, and the fine ladies "because 'tis a bauble of their fools' commending." Though politics constituted the chief interest of these papers, some flourished on fiction and on jokes. Most of the papers were published in London but some, even at this early period, in the provinces, in Scotland, in Ireland, and in Wales.

A new stage in the history of journalism was marked by the foundation of the *London Gazette* by Henry Muddiman in 1665. Appearing daily, and in folio sheets, it was the first journal to look like, and to be, a modern newspaper. Indeed, this word was coined soon after its birth to describe it. While the Licensing Act was in force, it had no rivals, but shortly after that act expired, in 1695, several other papers were started. They were all on the side of the Whigs and of King William. Though free from the licenser, they were liable to punishment for sedition and were not allowed to report Parliamentary debates.

In the reign of Anne newspapers and weekly journals became so popular that in 1712 the *British Mercury* reported:

The furious itch of novelty has been an epidemical distemper and has proved fatal to many families, the meanest of shopkeepers and handicraftsmen spending whole days in coffee houses to hear news and talk politics. . . . Hence sprang that inundation of *Postmen*, *Post Boys*, *Evening Posts*, supplements, *Daily Courants*, amounting to twenty-one every week.

In the same year Addison commented:

There is no humor in my countrymen which I am more inclined to wonder at than their general thirst after news. There

are about half a dozen ingenious men who live very plentifully upon this curiosity.

Among these ingenious men were two of the most talented pamphleteers that ever lived, Daniel Defoe and Jonathan Swift, each of whom published a newspaper in the interests of statesmen who paid them well. Swift's *Examiner*⁵ was the organ of the Tories, and Defoe's *Review* that of the moderates and of the moneyed interest. Some years later Bolingbroke started a paper to attack Walpole in a very vituperative manner.

By 1731 a writer in the *Gentleman's Magazine* estimated that "two hundred half-sheets per month are thrown from the press, only in London, and about as many more are printed elsewhere in the three kingdoms . . . so that they are become the chief channels of amusement and intelligence." This number increased steadily, until by 1774 no less than 12,300,000 newspaper stamps were sold per annum. By this time there were seven daily papers and ten other papers in London. These had now come to live largely from advertisements, a practice severely censured by Defoe early in the century as an unfair means of competition but one that grew rapidly, nevertheless. In 1766 a character in Colman and Garrick's *Clandestine Marriage* complained that the newspapers contain nothing "but anti-Sejanus and advertise." The "anti-Sejanus" is, of course, the political matter that abused the minister in power. Not until 1771 were the papers allowed to report Parliamentary debates. They won this right only after a hard struggle in the courts. While the new power gave them a wholesome curb on the abuse of governmental action, it did not make them much less partisan in their writing, or any less prone to appeal to the baser passions.

Nevertheless, they proved great educators. Johnson attributed to the periodicals the superiority of the British lower classes in intelligence. Boswell, who himself wrote for the *London Chronicle*, declared:

⁵ There was also a short-lived Whig *Examiner*.

I do believe that an English newspaper is the most various and extraordinary composition that mankind ever produced. While it informs the judicious what is really doing in Europe, it can keep pace with the wildest fancy in feigned adventures and amuse the most desultory taste with essays on all subjects and in every style.

A special place must be assigned to the weekly journals of which the most famous were those founded and chiefly written by Sir Richard Steele (1672-1729) and Joseph Addison (1672-1719). Steele began to publish the *Tatler* in 1709, and in the next year called in Addison to help him write it. Together they published the *Spectator* (1711-12), and the *Guardian* (1713). Each number consisted of a single short essay on some polite or literary topic, or sometimes on religion or morals. "I shall be ambitious," said Addison, "to have it said that I have brought philosophy out of the closets and libraries, schools and colleges, to dwell in clubs, at tea-tables, and in coffee-houses." In light touches, with humor and the most good-natured satire, he drew pictures of contemporary manners.

Before the *Tatler* and the *Spectator* [said Johnson], if the writers for the theater are excepted, England had no masters of common life. No writer had undertaken to reform either the savageness of neglect or the impertinence of civility; to teach when to speak or when to be silent, how to refuse or how to comply. We wanted not books to teach us our more important duties; but an *arbiter elegantiarum*, a judge of propriety, was yet wanting.

Written in a style "familiar but not coarse, and elegant but not ostentatious," these weeklies have taken their place in English literature. They were widely read not only in England, where the *Spectator* reached a circulation of 14,000, but in other countries. Goldoni reports their popularity in Italy, especially among the Venetian ladies. They had such hosts of imitators all over Europe that their historian, Dr. Marr, says there is nothing to be compared with their vogue in all literature.

Among the vast number of weeklies and semi-weeklies then published none attained the high literary and moral level of the *Spectator* and the *Tatler*. Many appealed only to the curiosity, credulity, and sometimes to the pruriency and to the group hatreds of large circles of readers. Very early journalists learned to interest large classes of readers not primarily devoted to politics. All sorts of curious information and misinformation was collected and appetizingly served up. Religion, morals, manners, sex, and science contributed tidbits to the jaded palate. Dunston's *Athenian Gazette or Casuistical Mercury* was founded in 1691 on purpose to "resolve nice and curious questions proposed by the ingenious," and flourished for six years by doing so. One of the first of these nice questions propounded was: "Why rats, toads, ravens, and screech-owls, &c., are ominous, and how they come to foretell fatal events." To this the editor gave the sensible answer that they were unlucky not because they were possessed of the power of divination, but merely because they were destructive or poisonous.

A wider net was cast by *The British Apollo, or, Curious Amusements for the Ingenious*. The contents of the issue for October 13, 1708, is thus analyzed by Thackeray: ⁶ 1. A sportive argument from the text that "a bishop must be the husband of one wife" that polygamy is justifiable in the laity. 2. Celinda asks whether, in the future life, we shall know those we love best in this life. 3. "Q" asks "Why does hot water freeze sooner than cold water?" 4. The question, "Who invented kissing?" is answered, "Nature was its author; and it began with the first courtship." 5. An article on the Duke of Marlborough and Prince Eugene at Lille.

Such miscellanea were generally condemned by the best opinion of the time on the grounds of illiteracy, vulgarity, and immorality. To a line in the *Dunciad* (I. 42) mentioning "Journals, Medleys, Mercuries, Magazines," Pope added the following vitriolic note:

⁶ W. M. Thackeray: *Essay on Steele*.

The common name of those upstart collections in prose and verse in which at some times "new-born nonsense first is taught to cry"; at other times dead-born scandal has its monthly funeral. . . . [They are] equally the disgrace of human wit, morality, decency, and common sense.

Very soon after Pope discharged this indictment there was founded a monthly magazine that, because of its literary excellence and intelligent editing long set a standard which rivals vainly strove to equal. *The Gentleman's Magazine*, founded in 1731, claiming "to pass by no object of laudable curiosity, omit no reigning topic of conversation, and forget no matter that may instruct the present age or be useful to posterity," presented its readers with a variety of politics, poetry, fiction, and literary and scientific news. It evaded the prohibition to report Parliamentary debates by disguising them as speeches "in the Senate of Great Lilliput." The success of the venture induced many to imitate it. The chief character of the magazine was its variety. As Goldsmith wrote (1760):

If a magaziner be dull upon the Spanish War, he soon has us up again with the ghost in Cocklane; if the reader begins to doze upon that, he is quickly roused by an Eastern tale; tales prepare us for poetry, and poetry for a meteorological history of the weather.

Finally, the literary review must be described as a special sort of periodical. Taking its rise with the *Mercurius Librarius* (1668) "the great-grandfather of the *Atheneum*," it was improved by the establishment of the *Universal Historical Bibliotheque* in 1686, which gave an account of the most important books in all languages, "with a short description of the design and scope of almost every book and the quality of the author if known." Reviewing is a thankless task. Pope struck at the art, already practised in his day, of gently depreciating a book without violently denouncing it:

Damn with faint praise, assent with civil leer,
And without sneering teach the rest to sneer;
Willing to wound and yet afraid to strike
Just hint a fault and hesitate dislike.

A generation later saw a popular caricature pillory the reviewer as sitting upon a throne judging books like so many criminals, while Truth sleeps and an ass brays.⁷

Somewhat tardily America followed the example of England. The hard economic conditions in the colonies during the seventeenth century, poor communications, and the dearth of news long prevented the establishment of regular papers. Something was done to disseminate news by announcements from the pulpits, by the services of town criers, and by the printing of broadsides both in prose and verse. The doggerel rhymes spread upon these sheets commented upon local incidents and sang elegies upon the departed great. The broadsides copied news from English papers or wrote up local intelligence afresh.

In 1690 some Boston printers began to publish regularly a sheet called *Public Occurrences* which, however, for the crime of "uttering reflections of a very high nature" upon the government was promptly suppressed. Fourteen years later John Campbell, the Boston postmaster, began to print the *Boston News-Letter* every week. For some years previously he had sent such missives in manuscript to the postmasters of the other colonies, but when the demand for them rose to three hundred copies, he obtained a license from the Massachusetts government, and began to print. The venture was so successful that publication was continued for 72 years—a long life for a newspaper in those days. The second and third New England newspapers were also started in Boston, the conservative *Boston Gazette* in 1719, and the more liberal *New England Courant* in 1721.

This last was founded by Benjamin Franklin's elder brother James. When, for an attack on "religious knaves," he was forbidden to print it in 1723, it was continued under

⁷ Paston: *Social Caricature*, no. xcvi (1765).

the name of Benjamin who, though only seventeen years old, really wrote much for it. In an early editorial he announced his policy thus:

The main design of this weekly paper will be to entertain the town with the most topical and diverting incidents of human life, which in so large a place as Boston will not fail of a universal exemplification.

The third American newspaper, and the first outside Boston, was *The Weekly Mercury*, founded at Philadelphia in 1719, by William Bradford. Nine years later came its rival, *The Universal Instructor in the Arts and Sciences*, which presently shortened its name to *The Pennsylvania Gazette*. Beginning by reprinting sections from *Chambers' Cyclopædia*, it early found it advisable to offer more timely articles contributed by Benjamin Franklin. From this time forth the other colonies rapidly entered the field of journalism until, by 1776, there were no fewer than twenty-two weekly papers scattered throughout all the colonies except New Jersey, whose needs were well served by the Philadelphia and New York press. Small and ill printed, copying most of their foreign news from English papers, containing literary as well as political items, these sheets, though often crude, educated the people in more liberal views than those commonly inculcated from the pulpit.

Besides newspapers America offered her children a number of native magazines, of which the first two began within a few days of each other at Philadelphia in 1741. The first to be issued was Andrew Bradford's *American Magazine, or a Monthly View of the Political State of the British Colonies*, and the second was Benjamin Franklin's *General Magazine, and Historical Chronicle, for all the British Plantations in America*. Each of these lasted only a few months, as did the third publication of the sort, the *Boston Weekly Magazine* (1743). A little more success attended *The Independent Reflector* published in New York in 1752, and the *American Magazine and Monthly Chronicle* founded in Philadelphia by Andrew Bradford in 1757. Among a

number of others which followed, the largest were Matthew Carey's *American Museum* with 1,250 subscribers and *The Pennsylvania Magazine* which had, in 1775, more than fifteen hundred subscribers. The purpose of these periodicals is set forth by one of them, *The Massachusetts Magazine*, which defined itself as:

a monthly museum of knowledge and rational entertainment, containing poetry, music, biography, history, physics, geography, morality, criticism, philosophy, mathematics, agriculture, adventure, chemistry, novels, tales, romances, translations, news, marriages and deaths, meteorological observations, &c., &c.

A typical American magazine of that period contained sixty-four octavo pages, sparsely illustrated. Three-fourths of the contents was taken directly from books or from English magazines, usually with frank acknowledgment of the source. Original essays in the style of Addison, verse, and articles upon religious, educational, literary, and social topics filled the remaining fourth of the material, supplying matter of local interest and timeliness.

Though the British and American journals often came into conflict with the authorities, they had on the whole much less trouble than did their French contemporaries. The first French periodical, *Le Mercure François, ou, la Suite de l'Histoire de la Paix*, was a year-book compiled from government proclamations and other official matter, and issued annually from 1611 to 1648. The first real newspaper, the *Gazette de France*, was founded by Théophraste Renaudot in 1631. Though he got a suggestion from the Venetian gazettes and from the English corantos, he wisely interested the government, securing from Louis XIII a license and monopoly. Published at first weekly in four pages, the *Gazette* offered news gathered from abroad and from domestic sources, and also official communiqués sent by Richelieu. Presently editorials, full of bonhomie, though occasionally satiric, were added. The civil conflicts of the Fronde caused the *Gazette* to divide into two papers; one published under the original title by Renaudot, who with-

drew to Saint-Germain and defended Mazarin; and the other, conducted by Renaudot's sons under the title *Courrier Français*, published at Paris and devoted to the cause of the Parlement.

While the Fronde called into being a vast number of pamphlets, commonly called *Mazarinades*, no journal worthy of the name was to be found among them. After the restoration of order the government frowned upon and generally suppressed all political newspapers except the official *Gazette de France* in Paris and a few provincial gazettes, such as that of Toulouse (1661), that of Besançon (1664) and that of Grenoble (1697). In order to supply the public demand for uncensored news a large clandestine press sprang into existence. As many of these newspapers were published in the Netherlands, the name "gazette de Hollande" came to be applied to them generically. Molière has characterized them from the point of view of the courtier in one of his plays.⁸ In this, one of the characters, a viscount, informs us:

An importunate old gentleman of quality asked me all the news of the court . . . and then showed me two sheets of paper, full from top to bottom with a great hotchpotch of frivolous stories which came, he told me, from the most reliable place in the world. Then, as if he were telling me something curious, with a mysterious air he read me a tiresome account of all the bad jokes of the *Gazette de Hollande*, whose interests he espouses. He thinks France battered to ruins by the pen of that writer, and that one only needs a little wit to dispose of all our troops. Then he passionately attacked the ministry, noting all their faults, so that I thought he would never stop. To hear him talk, one might suppose that he knew the secrets of the cabinet better than the men who made them. He can see all the designs of the policy of the State, and penetrate all the intentions of every act. . . . He is informed of all the affairs of Europe as well as of Asia and Africa; he knows exactly what is done in the council of Prester John and of the Great Mogul.

⁸ *La Comtesse d'Escarbagnas*, Scene i.

While political papers were suppressed, or much hampered, a number of literary and special journals were allowed. One of the best of these, the *Lettres en Vers* started by Loret in 1650, treated the theater, uncontroversial current events, and literature. Then came the great *Journal des Savants*, already familiar to the reader of this history. A few years later (1672) Donneau de Visé founded the *Mercure Galant* to offer the world of fashion news of politics, literature, the theater, and gossip about the doings of the great, together with poetry, riddles, and novelettes.

During the eighteenth century the battle over the new "philosophy" of Voltaire increased the interest of the public in literary journals, multiplied their numbers, and stimulated their competition. Some of these journals devoted their attention to French letters, some to foreign literature, and others to economics, military and naval affairs, religion, education, fashion, the theater, and the interests of women. In 1700 there existed only three journals in France, the *Journal des Savants*, the *Mercure Galant*, and the *Gazette de France*. In 1765 there were at least 19 journals published; in addition to these no less than 85 journals were started between the years 1700 and 1789, and lived at least one year. By far the ablest of them was the *Année Littéraire*, edited by the great journalist Elie Catherine Fréron from 1754 till his death in 1776. While this alumnus of the Collège Louis-le-Grand defended conservative ideas against Voltaire and the Encyclopedists, he inaugurated with vigor, taste, and learning, the best school of literary criticism in Europe.

The history of journalism in the other countries of Europe resembles that of the countries already described. The first newspapers published in Italy were the semi-official gazettes of Venice, containing dry notices of foreign events, accounts of festivities, court ceremonies, announcements, and news of the theaters. Their arid and innocuous intelligence, subject to strict censorship, was supplemented by manuscript and clandestine sheets filled with scandalous, or seditious fare. The first literary journal was the *Galleria di Minerva*,

published at Venice during the years 1696-1717. This was followed by the *Giornale dei Letterati d'Italia*, edited by Apostolo Zeno at Venice 1709-18 and famous for its eminent contributors. Among other periodicals was the *Biblioteca Universale* (Venice, 1725-26), a sort of review of reviews, *L'Osservatore* (1761-62) a journal of manners imitating the *Spectator*, the *Maggazzino Italiano* (1767-68), and the *Novelle Letterarie* (1740-68) acclaimed by Goldoni as the best of the current publications because of its well-informed, but conservative, attitude in regard to the French *Encyclopédie* and Voltaire.

The great "journal of opinion" was the *Caffè*, published at Milan during the years 1764-66. Its editor, Pietro Verri, the founder of a militant club called *Accademia dei Pugni* (Academy of Fists), set out to reform Italian manners and morals by attacks on idleness, gambling, slander, profligacy, and prejudice. Verri and his collaborators, among whom was Beccaria, proposed economic, legal, and educational reforms inspired partly by the French *philosophes*, and couched in the style of the English *Spectator*.

The place of newspapers in Spain was taken by short booklets called *Relaciones*, with accounts of court functions, of sensational crimes, and of the discovery of relics, stories, recipes, proverbs, and jokes. Political news was strictly suppressed by the government both in the mother country and in the Spanish colonies, where some short-lived news-sheets were published from time to time.

The Netherlands printed numerous political sheets, of which the first regular newspaper was the *Amsterdamsche Courant* (1609), and also some literary magazines. The outstanding Scandinavian paper was the Swedish *Argus* written by Olaf Dalin (1701-63) in imitation of the *Spectator*, and much influenced by the French apostles of reason. Even Russia enjoyed a newspaper founded by Peter the Great in 1703, and a moralistic weekly started by the Empress Catherine II in 1769.

3. L'ACADÉMIE FRANÇAISE AND FRENCH PROSE

In the seventeenth and eighteenth centuries French nearly attained the position of a universal language, not in the sense that it became the mother tongue of many nations, but in the sense that it became the second language of all those to whom it was not native. It became the instrument of diplomacy and of international intercourse, the vernacular of good society and of fashion, and to some extent the vehicle of science, philosophy, and thought, in all civilized nations.

Richelieu, having strengthened France abroad and the monarchy at home, having subdued the feudal nobles, crippled the Huguenots, beaten down factions in the royal family, and successfully resisted the House of Austria, conceived the grandiose idea of giving the French tongue the empire and ascendancy formerly held by Latin. The Letters Patent granted to the *Académie Française* in 1635 clearly state the purpose of the foundation, to make French "already more perfect than any living tongue, succeed Latin as Latin succeeded Greek."

What the cardinal began the Sun King completed. The enormous prestige of Versailles imposed French manners and literature, the French tongue and Gallic philosophy on the whole of Europe. The children of the rich and fashionable in all lands began to learn French from governesses of that nation, and perfected their mastery of it by a tour to Paris. Gallomania made the phrases and clichés of Saint-Germain the shibboleths of the polite world of all Europe. The *Académie des Sciences* abandoned Latin for French in 1699. The Academy of Soissons in 1710 pronounced a discourse, which attracted much attention, on "The Universality of the French Language." French books and newspapers were published in great numbers in Germany and in the Netherlands.

Still more striking were the conquests of the Gallic tongue under Louis XV—one is tempted to say, under Frederick

II of Prussia, for the greatest of German kings wrote and spoke almost nothing but French, and aspired to add the laurels of a poet in that tongue to those of a Prussian soldier. In Germany, as in France, French took the place of Latin in monuments, in schools and colleges, and even in churches. Whereas, during the seventeenth century, more than half the books published in Germany had been in Latin, and only about 3 per cent in French, during the decade 1761-70 Latin had declined and French had risen to 13 per cent each of the total number. In 1745 the Berlin *Académie des Sciences et des Belles-Lettres* justified their adoption of the modern tongue in these words:

We have substituted French for Latin in order to extend the usefulness of these *Mémoires*; for the boundaries of the empire of Latin are visibly receding, while the French language now occupies almost the same place that Greek occupied in the time of Cicero—everyone learns it; everyone looks for French books; all good English and German books are translated into it.

Maupertuis, the president of the same academy, defended the use of French by alleging that it was as universal as Latin and was superior to it in “the perfection of the idiom, the copiousness which our progress in the arts and sciences have introduced into it, the facility with which it can express itself precisely on all sorts of subjects, and the incomparable number of books written in this tongue.”

This eulogy was deserved. Less to the weight of the Gallic sword or to the glamor of Versailles than to its own matchless clarity and simplicity did French owe its universal sway. The government, the court, the salons, the lexicographers, the poets and novelists were all intent upon making the language worthy of its great destiny. The Letters Patent incorporating the *Académie Française* in 1635 enjoined upon it the duty of cultivating “the noblest of all arts, which is eloquence,” and of making the language “not only elegant but capable of treating all the arts and sciences.”⁹

⁹ *Anciennes Lois Françaises*, vol. xvi, 418.

The nucleus of the society was found in the meetings of a literary club at the house of Valentin Conrart during the years 1629-35. After the Letters Patent had been conferred by the king and tardily registered by the jealous Parlement of Paris, the society was constituted of forty members, commonly called the "forty immortals." These members have generally included the best writers, but not always. Neither Molière nor La Fontaine was ever elected; nor would Boileau have been but for the personal intervention of the king. On the other hand, many insignificant persons have found chairs in that illustrious body—so many that it became a matter of remark when any mediocrity with the slightest pretensions to literature was not elected. A famous epitaph and epigram declared:

Ci-git Perron, qui ne fut rien,
Pas même Académicien.

Soon after its incorporation the *Académie* set seriously about its task of

purifying the language of the filth which it has gathered either in the mouths of the people, or in the mob of the Palais de Justice, or in the impurities of chicane, or by the bad usage of ignorant courtiers, or by the abuse of writers and preachers who say the right thing in the wrong way.

Apparently the poor language was then in a parlous way, ill treated by the people, by the courts of justice, by the world of fashion, and by writers and preachers alike! What the Academicians set out to do was to make the language

free from ambiguities and from all obscurity, serious, sweet, and consistent, adapted to all styles, chaste in its vocabulary, judicious in its figures, friendly to elegance and to ornament but fearful of affectation, able to temper boldness by good taste and sobriety.

In order to do this they planned a grammar, a rhetoric, a treatise on poetics, and a dictionary, but only the dictionary was finished ¹⁰ after half a century of labor. The *Dic-*

¹⁰ The grammar appeared at last in 1931!

tionnaire de l'Académie, in two volumes (1687-91) tried to set a standard in orthography and in vocabulary. The authorities were usage and reason, with a preference for reason, that is, for logical consistency. Usage the editors took from the standard authors of the seventeenth century, for they were convinced that French had then arrived at its perfection. And yet the book had a poor reception. The printers objected to the simplified spelling, the writers to the limited vocabulary. The general public found fault, not unjustly, with the arrangement which was not strictly alphabetical, but was by roots—"forban," for example, being found under "bannir," though it might not be easy to guess that the word for "pirate" is derived from the word for "banish." Nor were the definitions exact or exhaustive. Moreover, the lexicographers had a distinct bias, a tendency, in harmony with their age, to be sure, to strip the language of concrete, colorful, picturesque, and succulent words, and to preserve, strengthen, and sharpen the abstract, rational, and prosaic elements. Their ideal was at bottom that of Wilkins and Leibniz and the other dreamers of universal tongues, to make a means of communication as exact and clear and colorless as is mathematical notation. What the Academy really did was to rob poetry to pay prose; what they accomplished was to make the French journeyman work of literature the best in the world, and to put a curb on the flight of genius and on the eccentricities of originality.

Language, however, is created by and for the people who speak it, and not by the grammarians who formulate its rules. What made French, in the reigns of Louis XIV and of Louis XV, the idiom of cultivated society everywhere was its formation in those homes of the social graces, the Parisian salons. The court itself was a great school of beautiful speech. The Sun King, superb actor and esthète that he was, spoke a truly royal French, sensible and yet noble, chaste and yet lofty. Around him the great poets and orators and wits, Racine and Molière, Bossuet and La Fontaine, La Rochefoucauld and Mme. de Sévigné, wrote,

played, sang, preached, and chatted in the most exquisitely chosen words that ever graced social intercourse. Some of the lesser members of this society, the ordinary run of marquesses and great ladies, considered their speech only too carefully, affecting a purity of vocabulary, a precision of construction, and an elaboration of antithesis and metaphor that gave them the name of the *précieux*, the euphuists or prigs of language.

Not less important than the court as centers of pure French and of *préciosité*, were those salons held by ladies of fashion for the cultivation of social pleasure and for the prosecution of political and amorous intrigue. A few of these salons have become so famous as to overshadow the rest; but in reality they were numerous and were not confined to the capital but were to be found in every province. In some of them the men exchanged small talk on their professions, the medicine and the law, and the women traded recipes. In some salons the talk was all of Newton and of Locke; in others of economics and politics; in still others of madrigals and the unities. In all, language was cultivated, conversation made a fine art, and wit esteemed above all things. The taste of the salons contributed enormously to make thought clear and shallow; and to make language lucid and sparkling. Diderot testified:

Women accustom us to discuss with charm and clarity the driest and thorniest subjects. As, in talking continually with them, we wish them to listen, and fear to tire or bore them, we develop a particular method of explaining ourselves easily, which method passes from conversation into style.

Even Rousseau, who lacked the social graces to the point of painful embarrassment, recommended the salons as schools of style:

There they talk of everything, for everyone has something to say; they do not treat questions profoundly, for fear of boring; but they propose topics as it were casually and discuss them rapidly and with an elegant preciseness. . . . Even the wise man

may gather from these conversations subjects worthy of being meditated in silence.

These salons were the nurseries of the reading public for which, more and more, the poets and novelists wrote. What this reading public demanded was clarity, distinction, *esprit* in the sense of ingeniousness, invention, and keenness of mind. Brilliant simplicity, a superficial sparkle, a readable rationalism, were encouraged. Language was devulgarized, purified, sometimes impoverished by an excessive elimination of the difficult and of the profound, but made clear, precise, smooth, and shiny. The Frenchman might have been wiser had he been less witty, but he would have been less admired by the general public with whom an epigram passes as a philosophy and a repartee as a self-evident truth.

Among the earliest theorists of style was Montaigne, who observed that the French of his day (1588) was more rich than cultivated, adulterated with a jargon of technical terms borrowed from hunting, war, and science, and yet unable to stretch to the compass of Latin or Greek.¹¹

The writers of the seventeenth century began at once to refine their tongue. Jean Louis Guez de Balzac (1594-1654) cultivated a pure, correct, logical, and beautiful diction. But the great and classic era of French letters was the age of Louis XIV (1643-1715). Then, in both prose and verse, a perfection of form rarely surpassed in any age or in any language was achieved. Then was formed the standard French which the lexicographers of the *Académie* tried to fix, and to which most later writers have looked back, as the model and norm of good writing.

The eighteenth century, unable to maintain the classical dignity of its predecessor, expanded the language by the adoption of numerous technical terms from the new sciences and arts, from agriculture, economics, commerce, industry, finance, physics, mathematics, and zoölogy. Sentences became shorter and crisper; perspicuity became the highest, and almost, except wit, the only, literary virtue. The public

¹¹ *Essais*, iii, 5.

for which the *philosophes* wrote no longer consisted of a coterie of fashionables, but included a large number of bourgeois in France and in other countries. To appeal to them one must be easy to read; to win them one must be sarcastic, incisive, and newsy.

The new theory of style was well expressed by Buffon in the famous discourse on his admission to the *Académie Française* (1753). "Style," according to him, "is nothing but the order and movement a writer puts into his thoughts. . . . A style is good by reason of the infinite number of truths it presents. All the intellectual beauties in it are so many truths." In addition to clarity, the tone should express the author's idiosyncrasy: "the style is the man himself." These were the ideas commonly held at the time. Condillac averred that "the whole beauty of style consists in two things: clarity and character."¹² Helvétius added: "Almost all rules of style reduce themselves to the production of clarity." For this, precision, purity, brilliant images, and strong thought are requisite; and the worst vice is ambiguity.¹³

Among the books most eagerly demanded by the public were the novels, of which a vast number began to appear in the reign of Henri IV (1589-1610). The return of peace after the horrible wars of religion turned men's and still more women's thoughts to the relief found in social intercourse and especially in love. The rise of the modern novel reflects the rise of woman in society. Man's love, verging on brusque lust, had been coarsely, or facetiously, depicted in Rabelais and Boccaccio. Woman's love, inclining to coy coquetry and long-drawn-out sentimentality, is the theme of most modern novels. The heroine of the hundred romances produced during the reign of Henri IV is always a young girl, whose chaste love usually triumphs over paternal tyranny and other obstacles, but sometimes succumbs to death or to a cloister.

Of these early novels the most famous was the voluminous *Astrée* (1607-27) by Honoré d'Urfé, Marquis de Valromey

¹² *Œuvres*, vii, 1 ff.

¹³ *Œuvres*, iv, 173.

et de Bâgé, a defeated soldier in the wars of religion. Laying his scene in Gaul of the fifth century, he makes the actors and actresses in the half-dozen love-plots of his book, men and women of rank masquerading as shepherds and shepherdesses, endlessly thinking of, talking of, and acting, love.

Even more renowned in their day, though unreadable now, were the works produced half a century later by Mlle. de Scudéry, especially *Le Grand Cyrus* (1649-53) and *Clélie* (1654-60). Full of amorous and yet chaste adventure, crowded with action, and not without humor, these vast romances arouse the modern reader from torpor only when they excite his sense of the ridiculous. They were, however, much prized by the younger generation of their own time, though reprobated by the elders. Molière introduces Gorgibus reproaching his daughters as follows:

I see you day and night curled up in nooks
 Reading with ardor those romantic books
 That fill your heads with love and silly notions;
 On *Clélie* you spend time, not in devotions.
 Into the fire I'll throw such books in sooth,
 Books that corrupt the minds of all our youth.

Similar disparaging estimates of the intellectual and moral qualities of the novel abound in the eighteenth century. While defended by their authors as teaching religion, ethics, and manners, they were denounced by the man of the world as muddling the mind and by the censor of morals as dangerous to virtue. The Duc de Saint-Simon, for example, speaks of the brain of the Duchess of Maine as "spoiled and corrupted by reading novels and plays."

A novel [said Lord Chesterfield] is a kind of abbreviation of a romance; for a romance generally consists of twelve volumes, all filled with insipid love nonsense and incredible adventures. . . . They confuse and corrupt the mind instead of forming and instructing it.¹⁴

¹⁴ *Letters to his Son*, 80.

And yet, this much despised genre was destined to a magnificent future. It has been the favorite form of writing ever since the eighteenth century; the form as characteristic and typical of modern culture as is the epic of primitive ages or the drama of the seventeenth century. The growth of democracy, the increasing education of women, the creation of an easier prose, all allowed the novel to flower out of the lower forms of fiction in the late seventeenth and early eighteenth centuries. In the hands of a master it proved to be as purging as tragedy, as free as the epic, as familiar as comedy, and an easy vehicle for conveying philosophy, politics, history, and knowledge of distant lands. Above all, it was the great mirror reflecting the every-day life of the average man, capable of depicting his conflicts with his fellows and with society, and of painting various, broad, intimate, and lifelike portraits of all types of men and women. True, it had vices as well as virtues: it was often shallow, vulgar, popular in the old bad, as well as in the good new, sense. But even its faults contributed to its marvelous sway over the mind of the modern reader.

"Modern fiction really began," says Edith Wharton, "when the 'action' was transferred from the street to the soul"; and this step was first taken, she thinks, by Mme. de Lafayette in *La Princesse de Clèves* (1678). This psychological note was cultivated successfully in the eighteenth century by Diderot, whose *Neveu de Rameau* creates a sordid, cynical, and desolatingly human figure unequaled until the nineteenth-century masters, Balzac and Dostoievsky.

More popular in their own day were the *Arabian Nights*—first made known to the French public in the twelve-volume version of Galland (1704-12)—and the picaresque romances of Alain René Le Sage (1668-1747). *The Limping Devil* (1707) is founded on the ingenious device of making the demon Asmodeus remove the roofs of the houses, thus revealing to his pupil, perched on a tower, the vices and hypocrisies of a city. *Gil Blas* (four volumes, 1715-35) satirizes men less for their wickedness or for their

folly than for their flatness. Notwithstanding its Spanish dress it is the most French of romances.

One of the greatest novels of the eighteenth century is *Manon Lescaut* (1731) by Antoine François Prévost (1697-1763). The hero is the most perfect example in fiction of the man who holds the world well lost for love; and the heroine is a remarkable portrait of a woman unfaithful to her lover because of her desire for splendor.

4. PROSE IN OTHER TONGUES THAN FRENCH

Under the combined influences of science, the growth of a larger reading public, journalism, and the example of France, the modern English prose style evolved. The marked and sudden change in English writing that came in the last half of the seventeenth century can be felt by anyone with the least sense of style. Prose became less majestic, less artfully involved, less emotional and ornate, but more lucid, easier to read, and better fitted for exposition and narrative. The pampered metaphors and far-fetched vocabulary of Sir Thomas Browne were pruned to the simple directness of Swift; the majestic thunder of Milton's periods was reduced to the ordered perspicuity of Dryden's sentences; the rugged and brutal power of Hobbes was subdued to the smooth evenness of Locke; the demonic outpourings of Cromwell were refined to the polished glitter of Bolingbroke's verbiage.

The driving forces in producing this change were, as already suggested, the influence of science and the appeal to a wider audience. But formally, the change may be most easily understood as the change from a Latin to a French model. In the earlier ages the only instruction in composition given to boys was in Latin; the very name "grammar school" for Latin school, indicates the kind of grammar taught. Though a few writers, like Richard Mulcaster, in the age of Elizabeth, glorified their mother tongue, almost all looked to the Roman writers for models and to the Latin syntax for rules of composition. Ben Jonson's

English Grammar (1640) based English usage upon Latin. This preference for Latin, slightly modified by Italian, Spanish, Greek, and Hebrew influences, persisted from the Renaissance through the Puritan revolution.

With the Restoration of the monarchy a powerful French current began to flow through all English life. The prestige of France was at its height; the literary glory of Italy and Spain had set, that of Germany had not yet arisen. Bishop Burnet observed that the right notion of style is to be learned in France, though (as Swift noted) he never learnt it himself. Or, as Pope¹⁵ phrased it:

We conquered France, but felt our captive's charms;
Her arts victorious triumphed o'er our arms. . . .
Late, very late, correctness grew our care,
When the tired nation breathed from civil war.
Exact Racine and Corneille's noble fire
Showed us that France had something to admire.

The foundation of the French Academy was generally admired in England, and was often held up as a model for imitation. James Howell praised Richelieu for it in 1650, while half a century later John Locke commends the French for

not thinking it beneath the public care to promote and reward the improvement of their own language. Polishing and enriching their tongue is no small business amongst them; it hath colleges and stipends appointed it, and there is raised among them a great ambition and emulation of writing correctly: and we see what they are come to by it, and how far they have spread one of the worst languages possible . . . if we look upon it as it was some few reigns backwards, whatever it be now.

Actual proposals for the establishment of a similar English body became frequent about the time of the founding of the Royal Society. In a continuation of Bacon's *New Atlantis*, the young Robert Hooke suggested the incorporation of a body of "eminent wits . . . to purify our native

¹⁵ *Imitations of Horace*, i, 263 ff.

language from barbarism and solecism, to the height of eloquence, by regulating the terms and phrases thereof." In 1664 the Royal Society actually appointed a committee for improving the English language. The most carefully conceived and vigorously urged plan was that of Swift in a letter to Lord Oxford. He suggested the erection of "a society or academy for correcting and settling our language, that we may not be perpetually changing it, as we do," and he gave definite rules for this purpose, complaining of neologisms, abbreviations, slang, and affectation, and advocating a simpler orthography. Though the project excited considerable attention and though many other proposals were made for setting up a body to make rules for spelling, syntax, and vocabulary, no action was taken to put the idea into effect. Not only in England but in America the plan of erecting an academy had many advocates, among whom one of the most influential was John Adams, later to be second president of the United States. In September, 1780, he wrote:

Many nations of Europe have thought it necessary to establish by public authority institutions for fixing and improving their proper languages. I need not mention the academies in France, Spain, and Italy. . . . But it is very remarkable that, although many learned and ingenious men in England have from age to age projected similar institutions for correcting and improving the English tongue, yet the government has never found the time to interpose in any manner. . . . The honor of forming the first institution for refining, correcting, improving, and ascertaining the English language, I hope is reserved for Congress.

The place of an English Academy was almost filled by the ample proportions of Dr. Samuel Johnson (1709-84), that writer of various prose and verse, that moralist, that student of the poets, that preposterous mixture of strong sense, accomplished scholarship, low prejudice, bigotry, brutality, fretfulness, and vanity, who talked so much and so amusingly to James Boswell. His *Dictionary of the English Language, in which the Words are deduced from their Originals*

and illustrated in their different Significances by Examples from the best Writers (1755) soon won a prestige that equaled, or exceeded, that of the dictionary of the French Academy. The first English lexicon, by Henry Cockeram (1623) had given brief definitions of a limited number of words without illustrations. Other dictionaries amplified and improved Cockeram; that of Bailey (1721) served as the basis for Johnson's work.

But Johnson aimed to do more than explain the meanings of words. He proposed to legislate for language, as he proclaimed in his preface:

When I took the first survey of my undertaking I found our speech copious without order and energetic without rules; wherever I turned my view there was perplexity to be disentangled and confusion to be regulated; choice was to be made out of a boundless variety, without any established principle of selection; adulterations were to be detected without a settled test of purity; and modes of expression to be rejected or received without the suffrages of any writers of classical reputation or acknowledged authority.

What he proposed was to write a dictionary "by which the pronunciation of our language may be fixed and its attainment facilitated, by which its purity may be preserved, its use ascertained, and its duration lengthened." The standard to which he appealed was that of the best English writers, a list of whom he drew up, and whose works he quoted copiously in illustration of his definitions.

Though the work, on the whole, is a marvelous achievement of industry and insight, it suffers from faults due to the limitations and prejudices of the author's mind. Knowing no Teutonic language but English, he was obliged to rely on others for the etymology of half his vocabulary. Not well versed in science, or art, or commerce, he omitted many technical terms. The same preference for polysyllables that caused him to make little fishes talk like whales made some of his definitions harder to understand than were the words defined. From him we learn that a "cough"

is "a convulsion of the lungs, vellicated by some sharp serosity," and that a "network" is "anything reticulated or decussated, at equal distances, with interstices between the intersections." The same prejudice that made him, in reporting Parliamentary debates, refuse to "allow the Whig dogs to get the best of it," colored his definitions of Whig, Tory, pension, and excise—which last is called "a hateful tax levied by wretches." It was such conspicuous deformities that impelled Hume to offer Boswell half a crown for every page of the *Dictionary* in which he could not find an absurdity, if Boswell would give him half a crown for every page in which one could be found.

Nevertheless Johnson accomplished much in fixing the standard of English. Some years before his time Addison had written:

The first race of authors, who were the great heroes in writing, were destitute of all rules and arts of criticism; and for that reason, though they excel later writers in greatness of genius, they fall short of them in accuracy and correctness.¹⁶

These last were the virtues chiefly admired by the age of reason:

I confess [says Blount] my only endeavor is to write and speak so as to be understood; and as for rhetoric, I leave that to those who delight more in the study of words than the nature of things.¹⁷

In like manner Hume, who wrote the plainest of prose, argued that over-elaboration is a worse fault in style than over-simplicity.¹⁸ In some cases this admiration of simplicity and plainness carried its devotees too far. Those who, like Newton and Wilkins, tried to speak the language of pure reason, produced something too like geometry to be attractive to, or readily assimilated by, the average mind. Effectiveness in style depends on other qualities as well as on logic. Variety, shading, emphasis, antithesis, color,

¹⁶ *Spectator*, May 10, 1711.

¹⁷ *Anima Mundi*, 1679, Preface.

¹⁸ *Essays*, 1742, i, no. 20.

cadence, and climax are necessary adaptations of argument or narrative to make it acceptable and persuasive. The secret of making prose pleasant as well as perspicuous was discovered simultaneously by several writers of the late seventeenth century. Sir William Temple first gave much attention to the arrangement of words in his sentence, both for the sake of the proper emphasis and for the sake of rhythm. Tillotson introduced into the pulpit a new homiletic style, abjuring the conceits and extravagances of his predecessors and speaking in a succinct and clear manner. Above all, John Dryden achieved a style so easy, flowing, lucid and delicate that, as Matthew Arnold says, we would all write it if we only could.

I have endeavored [Dryden wrote in the dedication of his *Rival Ladies*, 1664] to write English, as near as I could distinguish it from the tongue of pedants, and that of affected travelers. Only I am sorry that, speaking so noble a language as we do, we should not have a more certain measure of it, as they have in France, where they have erected an Academy for that purpose.

A higher flavor than that attained by Dryden, with no less perspicuity than his, was introduced by some writers of the early eighteenth century. Addison's conversational and journalistic prose has been justly admired. Jonathan Swift wrote so clearly, so forcibly, so pungently, that his style is now acclaimed in some quarters as the best English ever written. But, though marvelously efficient and clear, his style wants harmony, grace, and sometimes even correctness. Even more striking than the emergence of a few authors of supreme excellence is the rise in the general level of writing. Dr. Johnson was perfectly justified in saying, in 1778:¹⁹

There is now an elegance of style universally diffused. No man now writes so ill as Martin's *Account of the Hebrides* (1702) is written. A man could not write so ill, if he should try. Set a merchant's clerk now to write, and he'll do it better.

¹⁹ Boswell: *Life of Johnson*, iii, 243.

The good new style ripened more slowly in America than it did in England. Much of the literature produced in the colonies before the Revolution is turgid, vapid, ugly, and obscure. But John Wise wrote as good plain prose as any English publicist; Jonathan Edwards sometimes combined the eloquence of Tillotson with the charm of Berkeley; and Benjamin Franklin became, in manner as in matter, the greatest journalist and the most effective exponent of liberalism of his day.

It is perhaps worth noticing in this connection that the first divergencies of American and British English appeared in this early period. On the whole, the striking thing has been the refusal of the two nations to differentiate their language rather than their tendency to do so. There is less difference between the spoken accent and written style of the educated Englishman and the educated American than there is between the dialect of the Yorkshireman and the cockney, or of the Vermont farmer and the Mississippi planter. Of the slight differences between the English and the American tongues, some are due to the greater conservatism of the American. "I guess" is Chaucerian as well as Yankee; "sick" is used by the English Bible and the American where the modern Englishman says "ill." "Vase" was pronounced by Pope and is still pronounced in America to rhyme with "grace," instead of, as in modern England, like "vahz." The American "fall" for the English "autumn" is found in William Penn. "Billion" now means in England a million million, and in America a thousand million; it was defined in the American sense by George Berkeley.²⁰

The English books most read during the Enlightenment, as now, were novels. After the wild romances of chivalry, and after the admirable creation of character and dialogue in Bunyan's allegories, had palled upon the public, writers of fiction began to turn to everyday life for their favorite subjects.

The first great master in this genre was Daniel Defoe (c. 1659-1731) a political adventurer and journalistic hack,

²⁰ *Arithmetic*, 1707, *Works*, ed. Sampson, 1897, i, 6.

selling his pamphlets to the politicians and his stories to the public. His great success in both fields was due to his command of a remarkable technique for giving a true color to his inventions. He was, as Leslie Stephen has said, the best liar that ever lived. He could tell a ghost story so circumstantially, so flatly, that, as in his *True relation of the Apparition of one Mrs. Veal*, he seemed to be merely a reporter. He could give a fictitious history of the plague in London so much verisimilitude that it has deceived the very elect. He could make long biographies of prostitutes and adventurers as life-like as if they were true, and so life-like that they have often been, erroneously, supposed to be painted from actual people. His story of a castaway in a desert island has charmed many generations of children with its matter-of-fact record of surprising adventures. The style, cold, slipshod, pedestrian, and clear, gives the impression that the stories are told by a plain, blunt man, incapable of deceit.

If Defoe learned the art of realism in reporting for the journals, Samuel Richardson (1689-1761) learned it as writer of epistles for the illiterate. Not until the age of fifty did he turn the knowledge of human nature this practice had given him into a series of novels. When it was suggested to him that he should prepare a model letter-writer for readers of the lower class, he produced an absurd novel, called *Pamela*, "to instruct handsome girls who were obliged to go out to service how to avoid the snares that might be laid against their virtue." In the form of letters to her parents Pamela, a beautiful young servant, tells how her master first made love to her, kissed her "with frightful eagerness," tried to bribe, seduce, and finally to rape her, though all without success, for her virtue was incorruptible; she took it all as a matter of course, while she engaged in sweeping the parlor or in "flowering him waistcoats." Finally, her virtue is rewarded by marrying the world's worst cad, held by the author and his readers to be a desirable match because of his wealth and rank.

The second novel, *Clarissa*, tells in seven volumes of

letters (1747-48) a priggish, tedious, moralistic, and almost interminable story of a girl's struggles with her family to marry the man she loves instead of the one they had picked out for her. But, with all its faults, it is deeply moving in parts; and was praised by contemporary critics for its life and movement, and as being morally profitable. Johnson said that the author "made the passions march to the tune of virtue," which in practice meant that the most licentious suggestions (including another attempted rape) were introduced in order to reprobate and censure them. A third novel, *Sir Charles Grandison*, paints the picture of a model gentleman according to the extremely snobbish and priggish ideals of the writer, who intended to educate the public in manners and etiquette as well as in virtue.

In Henry Fielding (1707-54) the English novel "marched straight into immortality through the door of universality."²¹ This author introduced the method of intellectual realism that prevailed until the early twentieth century. His education as the son of a country squire, prosecuted at the University of Leyden as well as at home, and his experiences as a police judge in London, gave him a keen insight into the intricacies of human character. His definition of a novel is a comic epic in prose;²² his purpose was "to laugh men out of their favorite vices."²³ But, along with a sort of Hogarthian satire, he introduced a new manner of writing, of which he was quite aware, in setting forth human nature as realistically as possible. His first venture, *Joseph Andrews*, began as a parody of *Pamela*, by depicting the virtue of a young man-servant tempted by his mistress. *Jonathan Wild* paints the portrait of a criminal, and *Amelia* that of an amiable young woman. *Tom Jones* relates the history of a foundling, brought up by a worthy squire. "That exquisite picture of human manners," said Gibbon in a prophecy fulfilled in our time, "will outlive the palace of the Escorial and the imperial eagle of the house of Austria."

²¹ Chevalley. Work cited in bibliography.

²² Preface to *Joseph Andrews*, ed. by Saintsbury, I, xxxviii.

²³ Preface to *Tom Jones*, 1748.

Laurence Sterne (1713-68) though admired by Heine as a fellow of Shakespeare,²⁴ entertained and scandalized the public by stories equally realistic and indecent, and surprising as coming from the pen of a clergyman. The special talent of Tobias Smollett (1721-71) was the humor which made the novel of *Humphrey Clinker*, in the opinion of Thackeray,²⁵ "the most laughable story that has ever been written since the goodly art of novel-writing began."

A remarkable success in the field of fiction, as in other fields, was scored by Oliver Goldsmith (1728-73), a poor and thriftless Irishman who, after travels in France and Switzerland, settled down in London to make a living in any kind of literary work that came to his hand. Plays, poems, natural histories, political histories, criticism, and novels came with equal facility from his versatile pen. His knowledge of French authors, from some of whom (especially Marivaux) he borrowed freely, stood him in good stead for plots and incidents. *The Vicar of Wakefield* narrates the trials, the hardships, the virtues and the final happiness of an excellent parson. The interesting if absurd plot, the fine character-drawing, and the idyllic beauty of the picture won the highest admiration of Goethe.

In the creation of the modern prose style France and England took a decided lead. Other nations did something, independently or in imitation of them, but not so much as they did. The Southern nations had passed the bloom of their literature; the northern nations, except the Netherlands, had not yet attained it.

Italy, the home of the Renaissance, sank and fainted under the double yoke of foreign oppression and ecclesiastical bigotry. The severe rules of censorship promulgated by Clement VIII in 1595 and the example of Galileo half a century later stifled freedom of thought and expression. After Galileo's death no good Italian prose was written for at least a century. Until the peace of Aix-la-Chapelle (1748) literature became finicking and euphuistic, and style was characterized by an abuse of figurative language, a

²⁴ *Werke*, v, 331.

²⁵ *English Humorists*, 576.

fondness for antithesis, ornament, sonorous adjectives, florid conceits, and far-fetched tricks of vocabulary and construction. It was, in fact, branded by Carducci as "the vilest style ever written by slaves." After the middle of the eighteenth century, an improvement set in. Matter, rather than manner, began to be considered, and style came to be known for what it properly is, an instrument of thought rather than an end in itself.

The decadence of Italian literature was not due to a lack of writers and coteries to cultivate it. First of all, the Florentines formed a "pleasant society" (*piacevol brigata*), which met regularly after 1540 under the name of Gli Umidi—literally "the Moist, or, the Humid ones," with a pun on the derivative meanings of the word "humor." Their purpose, popular and anti-academic, was to cultivate the Italian language and to translate into it the Greek and Latin classics. The society later split into two, a learned section and a vernacular section, the *Accademia della Crusca*, or The Academy of Bran, the metaphor in the title being drawn from the winnowing of grain. This body, opened in 1586 under the "archconsulship" of Giovan Battista Deti, started, five years later, to compile a great dictionary of the vulgar tongue. Published at Venice in folio in 1612, under the title *Vocabulario degli Accademici della Crusca*, it attempted to settle definitions and orthography on the basis of the great Tuscan writers of the fourteenth century, from whom illustrations are taken. The third edition, published in 1691, widened the list of authorities, including the Ferrarese Guarini and the Modenese Tasso. Nevertheless, the standard remained too purely Tuscan to suit the ambitious writers of other parts of Italy. In 1764 much attention was attracted by an article on Language published in *Il Caffè*, declaring war on the Cruscan dictionary and advocating the formation of a standard tongue from all the dialects, the enrichment of the language by adoptions from French, and the recognition of popular usage rather than the authority of grammarians as the standard.

Besides the *Crusca* there were many other small acad-

emies and salons formed for the cultivation of prose and poetry. John Evelyn attended one of these at Rome on February 17, 1645, and has left the following description of it in his *Diary* under that date:

Academy of Humorists . . . where the wits of the town meet on certain days to recite poems and to debate on several subjects. . . . By these ingenious exercises, besides the learned discourses, is the purity of the Italian tongue daily improved. . . . There are several other Academies of this nature, bearing fantastical titles.

Among the later clubs of this sort the most famous was the Royal Academy founded by Queen Christina of Sweden in 1680, not long after she had settled at Rome. Its purpose was to discuss political and literary topics in a pure Tuscan modeled on the classics of the Augustan and Medicean ages.

In the golden days of Cervantes many Spaniards composed great dramas, novels, and poems. Among those who cultivated prose with special success, Luis de León, the mystic, the heretic, and the professor, defended the practice of writing in the vulgar tongue, and polished the Castilian by sifting the vocabulary and by studying harmony and cadence. After the middle of the seventeenth century the age of affectation set in, a period of decline, imitation, and weakness. Subtlety and obscurity were cultivated, together with that variety of euphuism known as "gongorism" from its first exponent, Luis de Argote y Góngora (1561-1627). This epoch was followed in the eighteenth century by the age of French influence. In 1714 the Spanish Royal Academy was founded in imitation of the *Académie Française*. As elsewhere, the most eagerly read books were the novels, of which a vast number were produced. The particular Spanish variety was the picaresque novel, or story of roguery, with an "anti-hero" as its protagonist and with scenes from low life as its background. In Spanish America, where the first book was printed in 1584, literature was chiefly devoted to the history of the conquest of the continent, and to the discussion of matters of local interest.

As the Dutch were the most civilized people of the seventeenth century they might have been expected to produce first-class literature, and they actually did so. Perhaps it only failed of recognition as a world-literature because of the narrow limits of the Dutch language and because of the great decline of Dutch power and prestige in the eighteenth century. Had the Netherlands developed a military might comparable to that of Louis XIV in Europe, had they continued to hold New Amsterdam on the Hudson River, Brazil on the Amazon, and South Africa, as well as the East Indian Islands, we might all be reading Vondel and Coster today instead of Shakespeare, Molière, or Goethe.

Very early the Dutch began to polish their tongue. Even during the war of independence fine dictionaries of the vernacular were published: Plantin's *Thesaurus Theutonice Linguae* in 1573, Sasbout's *Vlaamisch-Fransch-Woordenboek* in 1576, and Kilianus's fine etymological dictionary in 1583. About the same time societies known as Chambers of Rhetoric began to be formed or revived from earlier clubs. The most famous of these, that of Amsterdam, in 1584 published a *Short Method of teaching correct Dutch*. More renowned than the original society was its offshoot, called The Beehive, formed by a schism in the year 1617. While this, under the leadership of Dr. Samuel Coster, undertook to legislate for the language, great writers like Vondel and Hooft polished their style to a high perfection. Adriaan Koerbagh's dictionary, named the *Flower Garden* (*Bloemhof*) purified the vernacular of foreign words.

With the formation of a society animated by the motto "Nothing is hard to those who will," Dr. Lodewijk Meijer and others began to castigate the vocabulary of their tongue, to make rules for poetry, and generally to Gallicize their literary standards. This period of the dominance of fixed rules began in 1669, and ended in 1758 with the foundation of a periodical by a group of students of Leyden and Utrecht to advocate new principles in literature. The motto of their *Essays on Language and Poetry* was "to follow

pure nature in all her beauty." They were early Romanticists.

For ascertainable reasons the High Dutch tongue (as German was then called by the English) lagged far behind the Low Dutch. The Thirty Years' War laid waste the intellectual life of Germany, and the confessional conflict its spiritual life. Bitter religious polemic so filled the German press that men sometimes lamented the invention of printing because of it. The division of the country into small, weak states (until the rise of Prussia to the rank of a Great Power), and the prestige of foreign arms, led the Germans to a self-distrust that extended to a distaste for their own tongue. Perhaps the large number of universities and the high esteem in which they were held, continued to make Latin the vehicle of communication longer in Germany than elsewhere.

Statistics of the German book-trade, better preserved than those of other nations, clearly show the inferiority of the native language. Specimens of them are interesting enough to be introduced: ²⁶

<i>Decade</i>	<i>Latin</i>	<i>German</i>	<i>French</i>	<i>Total</i>	<i>Latin %</i>	<i>German %</i>	<i>French %</i>
1581-90	4,266	1,943	109	6,318	67.5	30.7	1.8
1611-20	9,930	5,000	486	15,416	64.4	32.4	3.2
1661-70	4,940	3,076	352	8,368	59.0	36.8	4.2
1681-90	4,051	3,995	288	8,334	48.8	47.9	3.3
1761-70	2,093	11,064	1,758	15,115	13.8	73.1	13.1

These figures show that until the end of the seventeenth century more Latin than German books were printed in the Empire; and that in the eighteenth century, when German books became dominant, a considerable percentage of French books partly made up for the losses of the Latin. But even these statistics do not tell the whole truth. Throughout the seventeenth century all the weightiest books were written in Latin, not only on serious subjects but in poetry and fair letters. Almost the only German books were intended for

²⁶ Paulsen: *Geschichte des gelehrten Unterrichts*, i, 625 ff.

the uneducated: tracts for edification, pamphlets, almanacs, and doggerels. But by the end of the eighteenth century only scientific and university publications continued to appear in Latin; all other fields had been conquered by German, except for those left to the writers of French, among whom must be numbered Frederick the Great.

Though German had produced a few great classics in the Middle Ages and in the Age of the Reformation, it totally lost its vitality in the latter part of the sixteenth century. At the beginning of the seventeenth, a few clubs were formed, such as the Fruitful Society (*Fruchtbringende Gesellschaft*) founded by Prince Ludwig of Anhalt on the model of the *Crusca* in 1600. At the same time a few schools began to teach the native tongue. But Martin Opitz was justified in declaring in a Latin tract called *Aristarchus* (1618), that German was universally regarded with contempt and had consequently degenerated into a jargon. Towards the end of the century Leibniz wrote his *Unprejudiced Thoughts on the Use and Improvement of the German Tongue*, objecting to the dominance of Latin, by ignorance of which large numbers were excluded from the benefits of science and learning, and by learning which the rest were compelled to purchase culture at the expense of years of toil, and advocating the cultivation of the vernacular both for national and cultural reasons. It was probably the influence of Leibniz that caused the erection of a department for the study and improvement of the native tongue in the Prussian Academy of the Sciences founded at Berlin in 1700. The purpose is set forth in detail in the *General Instruction* issued at that time by the Elector: ²⁷

In order that the ancient German national speech may be preserved in its proper purity and idiom, and not degenerate into a senseless and meaningless hodge-podge, we would, by means of our said Society and other suitable institutions, renew the attention to it which has almost lapsed into oblivion. And as we request our chanceries, offices, boards of administration, and courts

²⁷ A. Harnack: *Geschichte der königlichen Preussischen Akademie der Wissenschaften*, i, 98.

of justice to avoid unhappily borrowed foreign words, as much as they can, and on the other hand to preserve, seek out, and multiply good German idioms, so also we command that our Society be furnished with German names and descriptions of the things and processes with which it deals, by instructed persons in all walks of life. Furthermore we order that a vocabulary of German words be marked, collected and communicated to the said Society, such words to be drawn from the archives and records, and to include the obsolete and dialectic, by which much light will be cast on the laws, customs, origin, and history of our ancestors as well as on our present laws, customs, and condition.

After this date the reform of German proceeded apace, mostly through the efforts of voluntary societies, such as those founded at Leipzig (1697), Hamburg (1705), Jena (1728), Halle (1733) and Göttingen (1738). German even began to be used in university lectures: In 1730 Glassey composed *An Introduction to the Writing of German for the Man of the World*, with directions how to construct a well-rounded period that would cover eleven pages. Such a reform, perhaps, was worse than none. The official style became ever more tortured and barbarous. Efforts to purify the vocabulary by the expulsion of foreign words often overshoot the mark, as when Philipp von Zesen proposed, in the seventeenth century, to replace the word "Fenster" (window) with "Lichtloch" (light-hole) or "Tageleuchter" (day-lighter), and the word "Natur" with "Zeugemutter" (procreative mother). Happier, however, was the enrichment of the vocabulary with some of those abstract terms the lack of which Leibniz had deplored. Modern German is richer in its philosophical terminology than any other language has ever been; and it has thereby become the finest instrument of abstract thought ever created by the human mind, not even excepting the ancient Greek. In the eighteenth century Christian Wolff began the process of perfecting the language in this direction by the creation of such happy terms as "Verhältnis" (relation), "Vorstellung" (idea, or conception), and "Bewusstsein" (consciousness).

After the death of Luther (1546) German literature lan-

guished under adverse material and spiritual conditions, drawing a little life from foreign models. The period of Italian influence lasted till about 1620, that of Dutch influence till about 1680, that of French influence throughout the Enlightenment. After 1720 English literature began to have admirers and imitators, while at the same time at least one purely German genius of the first water was produced in Lessing.

During the two centuries between Luther and Lessing the best German was written by the novelists. In his *Simplicius Simplicissimus* (1669) Hans Jacob Christoffel von Grimmelshausen painted a life-like picture of the miseries of his fatherland during the "abominable and unheard-of frightfulness" of the Thirty Years' War. The book is too full of suffering, cruelty, coprology, and superstition to be pleasant reading. Men are described as

more swinish than swine, fiercer than lions, more lustful than goats, more jealous than dogs, more unruly than horses, more churlish than asses, more bibulous than cattle, slyer than foxes, greedier than wolves, sillier than apes, and more poisonous than snakes and toads.

In the whole story the only character with any patriotic or humane feeling is a demented vagrant.

Next to Grimmelshausen the great satirist of the age was Johann Fischart, a man of many moods, now harshly ob-jurgatory and again mildly playful. While his paraphrase of Rabelais's *Gargantua* is copious and virile, his best efforts were devoted to confessional polemic against the Roman church. It is highly characteristic of the age that its leading writer should have given up to a religious party what was meant for mankind.

CHAPTER X

POETRY AND DRAMA

I. POETRY

The Age of Reason has also been called the Age of Prose. That it did, indeed, prove more propitious to the creation of fine prose than to the production of great poetry, is to be attributed not only to the emphasis then placed on the rational at the expense of the emotional, but also to the losses suffered by poetry under the encroachments of science. The last three centuries have seen a real warfare between the bards and the scientists, resulting in the conquest by the latter of some of the realms once governed by the former. Poetry, which had once claimed to be the sum of knowledge and the supreme expression of wisdom, was now forced to take new ground in justifying her own importance. The separation of the sciences out of the body of poetry, one after another, has played a major part in determining the evolution of modern literature. Poetry no longer assumed to be knowledge; but claimed merely to be a vehicle of delight, and the plaything of the leisure class. Poets regained the importance lost by their forced relinquishment of the claim to inspired authority by associating themselves with people of quality. From being the quintessence of knowledge, poetry became the quintessence of refinement.

The evolution of poetic theory, though taking the general direction suggested in the last paragraph, was by no means a clear and uninterrupted progress. In Plato one may read that the bard is he who knows by inspiration what men of all other professions know by study and habit. In Greece and Rome great works of cosmogony, physics, and agriculture were put into verse. As poetry yielded up these fields,

she long retained her hold on the moral and religious life. In the Renaissance and later the theory of poetry derived from Aristotle and Horace emphasized the didactic function of verse. "Poetry teaches and does not simply amuse," wrote Julius Cæsar Scaliger (1561); while his contemporary Casaubon valued classic literature chiefly for its moral stimulus. Sir Philip Sidney defended poetry as "winning the mind to virtue by exalting the good and punishing the evil." Campanella defined poetry as "the art and instrument of the wise creator for inculcating happily, easily, and unobserved, the true and the good." Leibniz declared that "the chief end of poetry should be to teach prudence and virtue by examples." Muratori defined the two purposes of poems to be delight and the service of ethical and political philosophy.

John Dryden, in general, held exactly the same theory, and urged that, to fit himself for his high didactic task, a "complete and excellent poet" should

be learned in several sciences, should have a reasonable, philosophical, and in some measure a mathematical head . . . should have experiences in all sorts and humors and manners of men, should be thoroughly skilled in conversation, and should have a great knowledge of mankind in general.¹

At other times he inconsistently stated that "delight is the chief, if not the only end of poesie: instruction can be admitted but in the second place."

Dr. Johnson, who passed for the best English literary critic of his time, defined poetry as "the art of uniting pleasure with truth by calling imagination to the aid of reason," and declared that "the poet must write as the interpreter of nature and the legislator of mankind, and consider himself as presiding over the thoughts and manners of future generations."²

If the Enlightenment inherited from many predecessors the theory of the end of poetry, it evolved anew, or revived

¹ *Notes and Observations on "The Empress of Morocco."*

² *Rasselas* (1759), chap. x.

from some periods of antiquity, a characteristic theory of its practice. The history of literature shows the pendulum of taste oscillating between the classic and the romantic, between imagination and reason, and between poetry and rhetoric. All that was scientific, all that was practical, all that was rational in the eighteenth century fostered the qualities of perspicuity and logic appropriate to fine rhetoric, and discouraged the unrestrained expression of emotion and passion that inspires the greatest poetry. Verse, under the tuition of reason and good manners, became decorous, temperate, well regulated, and easy to understand. Pegasus was caught, tamed, broken to harness, and set to drawing heavy loads that prevented lofty and dangerous flights. Verse, it was thought, could be taught by rule; pleasure could be produced by a given recipe; lyric, epic, sonnet, madrigal, epistle, didactic verse, ode, and epigram could be built by attention to their natural laws. In all of them the chief qualities to be sought were the same as those then most admired in prose—clarity, lucidity, and wit. That was the age, as Austin Dobson puts it:

When Phœbus touched the poet's trembling ear
With one supreme commandment, Be thou clear!

And this clarity was to be attained by correctness of grammar and justness of sentence structure. Not fire, but polish, grave lustre to rhyme.

With the change in taste came a change in the value placed upon the great poets of previous ages. Addison described Chaucer's "unpolished strain" as rusted by time and Spenser's mystic tale as too barbarous and uncultivated to charm an understanding age; he omits Shakespeare from his list of the greatest English poets, eulogizes Milton's *Paradise Lost* as the first in design and the second in execution of the world's epics, and praises Dryden as the culmination of the British literary genius, uniting "the sweetest numbers and the fittest words." While Gray splendidly praised Shakespeare and Milton as displaying "the pomp and prodigality of heaven," Voltaire turned from a cool admira-

tion to a lively dislike of them. After commending Shakespeare with many qualifications, he became so exasperated by the attacks on his criticism that he finally declared the bard of Avon to have been a drunken savage, and compared the beauties in his plays to jewels in a dung-heap. Though more sensible to the genius of the great national poets of an earlier age, Dr. Johnson thought that only since Dryden had English poetry emerged from its "original savageness, refined its language, tuned its numbers, and improved its sentiments."

Italian taste, too, turned against her older bards. Galileo detested Tasso, and Bettinelli (1757) attacked Dante as "jejune in imagination, rancorous in suggestion, and rough in style." Voltaire declared that Dante continued to be admired only because he had ceased to be read. Horace Walpole³ summed up the more radical views of his age in the following sweeping judgment:

Dante was extravagant, absurd, disgusting, in short, a Methodist parson in Bedlam. Ariosto was a more agreeable *Amadis de Gaul* in a bawdy-house, and Spenser John Bunyan in rhyme. Tasso wearies one.

The movement to improve poetry by making it more classically regular began in France early in the seventeenth century. After the great burst of poetic fire emitted by the Pléiade came François de Malherbe (1555-1628), a Norman soldier and courtier, to reform the language and prosody of verse. While the subjects of his poems are the religious, patriotic, and amatory commonplaces of his day, his style purified French by excluding foreign words and provincialisms, and regulated versification by exact and formal practices that differentiated it from prose only in the external dress. "C'est proser de la rime et rimer de la prose," very justly complained one of his contemporaries. But, if he missed the lyric cry of emotion he caught the ear of most of his contemporaries and followers by his smoothness, his neatness, his clarity, and his common sense.

³ H. Walpole: *Letters*, ed. by Toynbee, xii, 274, 1782.

Not for nearly a century, however, did any writer put into theoretical form what most poets had long practised. This was done by Nicholas Boileau Despréaux (1636-1711) a Parisian educated at the college of Beauvais, first turning to the study of theology and then, upon the inheritance of a fortune, abandoning it for the cultivation of literature. His *Art Poétique* (1674), while really the manifesto of a school and the reflection of the current taste, aimed to discover and set forth the eternal laws of poetry. Love reason and moderation above all things, he cried:

In every subject, pleasant or sublime
Let good, sound sense be harnessed to your rhyme.

Learn to put your words in the right places, to reduce the muse to the rules of duty, to limit yourself by law, to avoid barbarisms and solecisms, to work slowly, and to adapt your style to the kind of poem you write. Above all follow Nature, for "the false is always insipid, boring, and feeble; but Nature is always true to the point of always being felt as such."

Inculcating these rules by precept, he put them into practice in a mock-heroic epic called *The Lectern* (*Le Lutrin*), and in a series of satires expressing the general opinion that

Of all the animals that fly or swim or creep
On earth or in the air or in the ocean deep,
From Paris to Peru, from Rome to far Japan,
The silliest, I think, the most absurd, is man.

Both Boileau's style, a pastiche of classic phrases carefully reviewed and polished, and his precepts, were generally admired in his own age and for a century thereafter. France overthrew the monarchy before it disputed the authority of Boileau. Voltaire, who respected nothing else, divine or human, respected the Alexandrine, the unities, and the cæsura. The reaction of the Romantic school was violent. To Keats and his fellows "one Boileau" became the bugbear and arch-enemy.

Many long epic poems and innumerable lyrics were written in France in the seventeenth and eighteenth centuries; none of the former and few of the latter were inspired. The writers tried to imitate Homer, Virgil, Horace, and Tibullus, and to live up to the rules of authority and taste prescribed by the *Académie* and the court. Classical allusion, good taste, a familiarity with the usages of polite society and with the *convenances* were the qualities chiefly valued. Chapelain, a wretched verse-machine, was called, in a patent of Louis XIV, "the greatest French poet that ever was" because he had "the most solid judgment." Huet said that "if Vauquelin de la Fresnaye had only joined to his talents the politeness of the best society he would have been equal to the greatest poets of his age."

Among the true poets of the reign of the Grand Monarch only one dared to complain that the French language was "neither harmonious nor various nor bold nor capable of lofty flights" and that the laws of prosody were so exacting as to render the execution of a long work in beautiful verses almost impossible. This was Jean de la Fontaine (1621-95), born at Château-Thierry, educated in theology at the Oratory, but, as a Libertine, a Gassendist, and an Epicurean, living a most secular life, without religion and devoted to pleasure and to the muse. His *Novels* (1664 ff.), his *Tales* (1665 ff.), his *Fables* (1668 ff.) have delighted many generations by their happy, smiling humor and by their harmonious and variegated verse. The *Fables* taught a tolerant worldly wisdom, with a mild satire on contemporary society. "The Fox and the Crow" depicts the flatterer and his dupe; "The Cricket and the Ant" teaches the value of thrift; the frog who tried to swell up as big as the ox is the "bourgeois who imitates the great lord and the petty prince who imitates the mighty king." While the *Fables* are so decent as well as so pretty that they have often been given to children, the *Novels* and *Tales* are fully as licentious as those of Boccaccio and Rabelais and Margaret of Navarre, from whom they are mostly taken. But, though the suggestion is as voluptuous as ever, the language has been refined.

Delicacy has become a matter of manners rather than of morals.

The first Englishman to cultivate the new and tame variety of verse was Edmund Waller (1606-87), a graduate of Eton and of Cambridge whose small invention, smooth regularity and monotonous elegance won the admiration of his age. His editor called him, in 1690: "the parent of English verse, and the first that showed us our tongue had beauty and numbers in it. . . . The tongue came into his hands like a rough diamond: he polished it." The greatest critic and poet of the age fully concurred in this high estimate, averring that rhyme's "excellence and dignity were never fully known till Mr. Waller taught it; he first made writing easily an art."

The author last quoted is John Dryden (1631-1700) that versatile and fickle genius who wrote with equal facility and with equal technical skill odes to Cromwell and salutations to Charles II, expositions of Deism and apologies for Catholicism, the best prose and the best verse of his generation, tragedies, comedies, translations, songs, essays, epics, and allegories. Preferring the severer style of the Romans "to the looseness of the Grecians," rhyme to blank verse, order to inspiration, Dryden really dominated the poetry as he had formed the prose of the Augustan Age. In the one as in the other he introduced something of the new scientific vocabulary. In *The State of Innocence* (a *rifacimento* of *Paradise Lost*) he made Adam quote Descartes. In his theory of poetry he followed suggestions of Hobbes. In his religious poems he evinced much conversance with the Biblical critics. The best subjects for his longer poems he found, with a journalist's instinct, in current events. *Ab-salom and Achitophel* (1681) describes, in a transparent disguise, Monmouth's rebellion. *The Hind and the Panther* (1687) deals with the contemporary struggles of the English sects. His fieriest poems are his two odes, *On Saint Cecilia's Day* and *Alexander's Feast*, which last, said Voltaire, "passes in England as the masterpiece of the most sublime and most varied poetry." Some hostile critics, like Matthew Arnold,

have charged him with composing poems with his wits rather than with his soul. But perhaps they are wrong. Even Wordsworth allowed him "a certain ardor and impetuosity of mind" and "an excellent ear." Even "wits" are not altogether despicable.

A perfect disciple of Dryden, with a larger portion both of his peculiar defects and of his particular merits was Alexander Pope (1688-1744). The precocious boy so injured his health by hard study that he developed a deformity, accompanied by nervousness, that affected his character unamiably, adding spite to his satire and a love of deception to his artifices. Nevertheless, he got what he wanted and what he studied above all things, a style. Such wit, such virtuosity, such technical skill, such lucidity, such sting, are hardly equaled elsewhere. Next to Shakespeare he is the most quoted of all British authors; in his own age he was the most popular of all. Violently attacked by the Romantics, and still abhorred by those who turn to poetry for spiritual comfort, he has been, and is, and always will be, enjoyed by men of intellectual tastes for his purely intellectual merits. Whether Pope be a poet or not depends on the definition of poetry; if we define it so narrowly as to exclude him, we must yet admit that he is a marvelous master of versification.

Lacking profound emotion and original thought he essayed only to give a new and striking form to ancient commonplaces, on the theory that

True wit is nature to advantage dressed,
What oft was thought, but ne'er so well expressed.

This was the theory of the time. Addison endorsed it in the words:

Wit and fine writing do not consist in advancing things that are new, but in giving things that are known an agreeable turn. It is impossible for us, who live in the latter ages of the world, to make observations in criticism, morality, or in any art or science, which have not been touched upon by others.⁴

⁴ *Spectator*, no. 253 (1711).

So it is that one can often recognize, not only in Pope's main ideas, but in his epigrams and turns of phrases, a remodeling of others' thoughts. Dryden said: "The sound of the poet's words has often somewhat that is connatural to the subject." Pope turned it into

The sound must seem an echo to the sense.

Milton had written: "They go about to impair your merits with a trivial and malignant encomium";⁵ Pope whittled the sentence to "damn with faint praise." Pascal had said: "The study of man is the true study proper to man";⁶ Pope pointed the epigram:

The proper study of mankind is man.

The new theory of poetry was expounded in an *Essay on Criticism*, imitated from Boileau but far surpassing him in power of expression. To follow nature and the Greeks, to cultivate taste, to select a pure vocabulary, neither archaic nor neologistic, to vary one's phrase, and to avoid the trite and the paradoxical, are the maxims chiefly inculcated.

Among the writer's other works one must mention here *The Rape of the Lock*, "an heroi-comical poem" on gay society, the imitations of Horace, the epistles and satires, and the translation of Homer. This last, immensely popular and spirited, is, as Bentley and Matthew Arnold have stated in different ways, a fine poem, but not to be called Homer.

A master of mightier music than can be found elsewhere in the period of the Enlightenment, was Thomas Gray (1716-71), a shy recluse who spent a life in studying and in composing poetry. Ranked by some critics as next to Shakespeare and Milton in the richness of his genius, he yet produced very little, in comparison with them, though that little is almost perfect. Perhaps the chill north wind of prose and of common sense discouraged the luxuriance of the production even of a mind like his. The *Elegy in a Country Churchyard*, and the matchless odes are too well

⁵ *Areopagitica*, *Prose Works*, ii, 19.

⁶ *Pensées*, no. 144.

known to bear quotation. Commonplace thought about the shortness of life and the vanity of wealth, glory, and pleasure are dressed in splendid language and adorned with rich imagery.

Notable in Gray are two elements that rather anticipate the thought of the coming age than reflect that of the contemporary one. The sympathy with the poor and lowly, so feelingly expressed in the *Elegy*, is a presentiment of the advent of democracy; the lively interest in the exotic and in the medieval prepares for the triumph of Romanticism. The ode on *The Progress of Poetry* refers to Erse, Norwegian, Welsh, Lap, and Amerind songs, all of which Gray had himself investigated. Of his other odes one is attributed to a Welsh bard, and others are from the Norse. Gray was charmed with the Erse poetry published by Macpherson in 1760.

During the latter half of the Enlightenment the current of Romanticism began to flow more and more strongly. As a rebellion against the prevailing order and classicism it found its springs chiefly in two sources, a love of natural scenery and wild landscape, and an interest in the foreign and remote, both in time and in place. In far lands and in other ages men found the solace denied them in the oppressive civilization of their own time and country. In

The negligence of Nature, wide and wild,
Where, undisguised by mimic art, she spreads
Unbounded beauty to the roving eye,⁷

men found a welcome relief from monotonous regularity of artificial cultivation. In Thomson's *Seasons*, just quoted, in Edward Young's *Night Thoughts* (1742), in Gray, and in Chatterton there are large romantic elements. This last named genius, who died in early youth (1752-1770) composed in boyhood some poems in an archaic dialect which he feigned to have found in a medieval manuscript. They were generally regarded as extremely beautiful until it was discovered that they were not what they were claimed to be;

⁷ James Thomson: *The Seasons*, *Spring*, 502 ff. (1728).

and then they were denounced as a forgery and neglected until they were revived on their own merits.

More genuine, though not altogether so, was another famous publication of early English verse, the *Reliques* edited by Percy in 1765. Though the editor rescued from oblivion many fine ballads of the Middle Ages, and though he collected a noble anthology of genuine poetry, he made drastic changes in his texts to adapt the stories, the tone, the mood, the landscape, and the literary manner of his originals to the taste of his age.

It is a remarkable illustration of the general law that in ideal as in material goods the demand creates the supply and that men will find what they set out to find, whether it exists or not, that the growing romantic temper of the latter part of the Enlightenment fed chiefly on forgeries. Those in love with a more intense, exalted, and natural temper than they got from the official poets, believed that they could find what they wanted in more barbarous societies and ages than their own; and, if it did not really exist there, they forged it. The most famous of these literary counterfeits were those of James Macpherson, a Scottish antiquary who began by publishing, in 1760, some genuine *Fragments of Ancient Poetry, collected in the Highlands of Scotland and translated from the Gaelic and Erse Languages*. Stimulated by the warm reception given to these songs by a public tired of art and longing for the wild, natural, and enthusiastic, Macpherson proceeded to publish *Fingal*, which purported to be "an ancient epic by Ossian, the son of Fingal, translated from the Gaelic language," but which really was concocted by Macpherson himself from ancient traditions, a few genuine Gaelic fragments, and a liberal intermixture of tags from Homer, Job, Milton, and other poets. Though the work won an immense success, its genuineness was suspected even in its own day. Samuel Johnson declared that it was not authentic and that it had no merit;⁸ and David Hume declared it to be a tiresome, insipid performance, and its reception as the genuine work

⁸ Boswell: *Life of Johnson*, i, 396.

of an ancient royal bard "the most curious effect of prejudice, where superstition had no share, ever seen."⁹ While humbly concurring in this opinion, I must record, as a historian, that it had more influence on the public mind than have most works of the highest merit and of the most indubitable authenticity. The bardic poems of Macpherson were translated into many languages; whole nations went mad over them. The common opinion was that "Homer and Ossian elevate the soul," and that, of the two, the Gael was more elevating than the Greek.

The other countries of Europe had much less to boast of, in the way of poetic achievement during the Enlightenment, than had France and England. In general they followed the taste of these two countries, especially of France. German poetry, early in the seventeenth century, became rational, appealing to the understanding rather than to the emotions. Seeking only to decorate or to elaborate some commonplace of thought or sentiment with a variety of artifices, it finally degenerated into rhetorical prose. Martin Opitz (1597-1639) issued the manifesto of this school in his *Book of German Poesie* (1624), expressing the idea that the subject of a poem is immaterial and that its value proceeds solely from the decoration of a trivial idea in baroque forms. Except for a few fine hymns, nothing of lyric value was produced for a century. The ideals of the later versifiers were set forth by Christian Wiese of Leipzig in a book the contents of which are indicated by the title: *Careful Thoughts on German Verse: a Method whereby the student of the most gallant part of Rhetoric may find the fitting and practicable, so that he may recognize good verses and himself easily and skilfully make them, and keep them within proper bounds* (1691). These verses were to be written in "the new, concise, neat diction" which the Viennese poetaster Heräus defined as "the soul of true culture." Those poems actually written at the time were Frenchified, pedantic, finicking, furiously revised, and thoroughly prosaic. Only the Swiss scientist, Albrecht von Haller, in his poem on

⁹ Hume: *Essays*, ii, 415.

The Alps, introduced a more natural, simple, healthy, and free note.

There was strength and promise also in the *Messias* and in the lyrics of Friedrich Gottlieb Klopstock (1724-1803), who sounded the morning call of idealism, individualism, storm and stress soon to become dominant in the Romantic school. The *Messias* (1748) sings of the redemption of mankind by Christ's death and resurrection; often, but ineptly, compared with *Paradise Regained*, it is rather an oratorio than an epic, finding its nearest analogies in the works of Bach and Handel rather than in those of Milton. In a short poem, *The Two Muses*, Klopstock placed the muses of Germany and England side by side, predicting the equal glory of both. In another poem, called *Prophecy* (1773), he foretold the emancipation of Germany and the rule of reason.

2. THE DRAMA

The crowning glory of the age of Louis XIV is the French classic drama. It began with the production of Corneille's *Cid* in 1636 and practically ended with the production of Racine's *Phèdre* in 1677. Chronologically it falls, therefore, in the Age of the Great Renewal rather than in that of the Enlightenment. But in spirit and in form it is allied rather with the later than with the earlier developments, and is intimately connected with the other literary phenomena treated in this chapter. In spirit and in mind as well as in time Molière lies half way between Shakespeare and Voltaire.

French drama reached its maturity just as the great epoch of English drama was ending. But the contrast between the two is enormous. The former is romantic, spontaneous, naïve, unbridled, passionate, and irregular; the latter is classic, controlled, sophisticated, artificial, cultivated, and disciplined. The elder studies man; the younger the gentleman; the English drama depicts society in the large sense, the French is dominated by the conventions of society in the

small sense; the one has little to say of politics and religion, the other a great deal.

All the influences that moulded modern prose and poetry worked also to form the French drama. It was written in and for the court of the Sun King, for an audience that cultivated pure speech, that was regulated by an elaborate code of etiquette and of honor, that was tintured with science and philosophy, and that came in contact with high politics. To meet the tastes of this audience, so different from the public for whom Shakespeare wrote (though occasionally the monarch patronized his plays), the French drama became highly artificial. Not only was the language polished and purified, but certain dramatic conventions were adhered to. These were the three "unities," of action, time and place, formulated by Chapelain about 1630 from what he believed to be the teaching of Aristotle. The modern interpreters of the Stagyrte insist that he recognized no other unity than that of action, which demanded coherence and singleness of plot; but Chapelain believed that he also prescribed unity of place, which demanded that the theater should represent the same scene, and unity of time, which demanded that the action should take place within twenty-four hours. These rules were defended on the ground of verisimilitude. In fact, they often introduced more difficulties than they eliminated. A small stage, lighted by candles, might just as well represent two cities in different scenes as represent a German forest, or a sea-coast. The requirement for unity of time forced the dramatist to crowd half of the actions of a lifetime into a single day. The Cid, who fought two duels and a battle, and in the intervals experienced all the vicissitudes of courtship and transacted much other business, all within twenty-four hours, might well have felt that that was his busy day.

Another convention which French tragedy shared with that of other nations but which it carried further than any other drama ever did, was that of idealizing its heroes, who were all presented as accomplished gentlemen of the French court. Polyeucte, the early Christian martyr of the Roman

Empire, appeared on the stage dressed in the fashionable small-clothes of the seventeenth century with a feather in his cap and lace at his wrists; the kings of the Gepidæ and of the Ostrogoths in *Attila* are profound politicians and sentimental lovers. Moreover their standards of honor and of virtue are so superhuman as to exceed the bounds of credibility. The ideal held up by the dramatists contrasts painfully with the prevalent lack of public spirit and common honesty in the government of seventeenth-century France. It reminds one of Burke's saying that the state "which lays its foundations in rare and heroic virtues will be sure to have its superstructure in the basest profligacy and corruption."

In this, as in some other matters, Corneille was true to his own motto that the dramatist should go beyond verisimilitude. "We should not limit our heroes to moderate virtue," he said in defense of *Polyeucte*, and accordingly in that play presents a hero insisting on martyrdom in order to allow his mistress happily to marry his rival, while the rival and the mistress are only a little less ready to immolate themselves. So it is throughout many of the tragedies; parents are prepared to sacrifice their children and lovers their mistresses at the call of duty. The virtue they proclaim is a prodigy. Their chosen examples of it illustrate moral paradoxes at which the reason is perplexed and from which the heart recoils. But all drama is more or less conventional. Where there is so much sublimity in Corneille, so much human nature and high comedy in Molière, so much beauty in Racine, it would be stupid to wish them other than they were.

That the triumph of classicism in the theater was the victory of the *Académie* and of the court is clearly proved by history. Prior to 1630 French plays, like the popular novels, had been decidedly romantic. The heart of the first of the three greater dramatists was with the Romantics; but he was forced by official pressure to confine himself more and more by the classic rules. Pierre Corneille (1606-94) was always the provincial, even after he migrated, in his

fifty-sixth year, to Paris. He never acquired either the manners or the tastes or the conversation of the court; much less its morals and free thought, for he was always the pious Christian and the good man. Most of his plays preach virtue, duty, and the power and freedom of the will. The prominent place of the free will in his plays he owed partly to his stout Norman heart and partly to his education by the Jesuits, those champions, against the Jansenists, of man's power to choose his own conduct. From Montaigne, too, he perhaps learned, what Descartes learned in turn from him, that the will should rule the passions.

Partly to his doctrine of the will, partly to his interest in the expansive nationalism of his country, he owed his favorite subjects, which are mostly drawn from Roman history. As Shakespeare wrote a history of England in a series of dramas, Corneille illustrated the whole history of Rome, Republican, Imperial, and Christian, with his numerous tragedies. In Rome he found the lesson in conquest and government so eagerly studied by France; in the Romans, as presented in Plutarch and later historians, he found the passionate patriots and stoical megalomaniacs that he admired. He studied character more than plot, and in character he admired only strength. Even his women are virile. The point of his tragedies, and their greatness, lies in the moral machinery by which the will is made to subdue the passions. He scorned love, the favorite subject of most playwrights, as "a passion too charged with weakness to dominate a piece." The subject of tragedy, he said, should be "illustrious, extraordinary, and serious"; and it should be treated in the loftiest language. His verse at its best is grand; at its worst a stilted jargon of rodomontade studded with tragic epigrams; and in general strong cold, clear, and monotonous.

After producing two or three plays of minor importance, Corneille made a sensation with the *Cid*, the appearance of which, late in 1636 or perhaps early in 1637, marks an epoch in the annals of the stage. The plot in this case he took from a Spanish play by De Castro, but he changed much in

order to eliminate the grossness and trivialities of the original, and to exalt the character of the hero. The plot, as it emerged, is this. Rodrigue, called the *Cid*, and Chimène love each other and are about to marry when the father of Chimène insults the aged father of Rodrigue. Rodrigue, as in honor bound, challenges and kills him. Chimène, torn between love and duty to her father, begs the king for justice on her lover. By winning a victory over the Moors, and by killing in a duel Don Sanche, another lover of Chimène, Rodrigue finally expiates his guilt and marries his beloved. Though the happy ending seems a concession to human weakness, it does not come until the principal characters have shown their preference of honor to happiness. The heroine exclaims:

To keep my glory bright and end my endless pain
I ask my lover's death, to die when he is slain.

Rodrigue protests that, if necessary to his honor, he would kill Chimène's father again; and one of the fathers comments:

Our honor is but one; many our mistresses;
While love is a delight, honor a duty is.

Received with enormous applause by the public, the *Cid* was attacked by the *Académie* and by Richelieu. While the chauvinists objected to a Spanish, instead of a French hero, Chapelain and the academic party charged the plot with improbability in making a girl marry her father's slayer. These criticisms told upon the author. Thereafter he abandoned the romantic freedom of tragi-comedy for the simple and severe classicism demanded by the arbiters of public taste.

His next important tragedy, *Horace*, is a hymn to patriotism based on the story in Livy of the duel between the three Roman brothers, the Horatii, and the three Curatii as champions of Alba Longa, Rome's enemy. Though one of the Horatii is married to a sister of the Curatii, and one of these betrothed to a sister of the Horatii, love of country triumphs

over the love of woman, and also over paternal love, for the father of the Roman champions prefers their death to their dishonor. The horrible climax comes when Horatius kills his sister, Camilla, for taking the part of her betrothed against her country.

The next Roman play, *Cinna*, was intended to teach a lesson in clemency to Louis XIII, and the next to that, *The Death of Pompey*, was a glorification of liberty. Disgusted with politics, Corneille then turned to religious subjects. *Œdipe*, though the plot is taken of course from the Greek drama, is really an attack on Jansenism and the doctrine of predestination. If our wills are not free, the protagonist argues, we should be mere machines, virtuous without merit and vicious without fault. Another drama, *Polyeucte*, drives home the same lesson by showing how an early Christian prefers martyrdom to all the seductions of wealth and of love.

If Corneille disliked the despotism of his government, he thoroughly approved its policy of conquest. His next drama, *Nicomède*, was intended, he himself admitted, "to paint the foreign policy of the Romans, their dealings with their allies, and the maxims on which they acted to prevent the aggrandizement of other states." Though admirably carried out, the purpose of this play did not sufficiently interest the public, which was beginning to find politics boring and to demand a love intrigue. Accordingly Corneille gave them love, but in a characteristically Corneilleian form, in which abnegation is carried to the point of a personal debasement that violates the laws of human nature. When, in *Othon*, the hero hesitates whether to marry Plautine or Camille, Plautine, in a passion of self-sacrifice sublimated to madness, though deeply in love with him, urges him to marry her rival and even threatens, if he refuses, to give herself to the infamous freedman, Martian.

In addition to these and other Roman tragedies, Corneille produced several comedies and ballets. One of these, *Don Sanche d'Aragon*, he called a heroic comedy because it dealt with people of high rank. It gave offense at the time be-

cause it represented a queen in love with a subject, although one of noble character. *L'Illusion Comique* is another mixture of tragic and comic elements. *Cupid et Psyché*, a comedy-ballet, in which Corneille and Molière collaborated, depicts a fine love story. *Le Menteur* is a comedy of character quite in the style of Molière.

But not equal to Molière. Indeed, what comic dramatist, except perhaps Shakespeare, has ever been equal to this "mock as pensive as an apostle," this playwright whose comedies border on tragedy and are great just because they are written by one with a powerful and intimate grasp of human life? The defender of common sense, the libertine filled with the skeptical spirit of Montaigne and Gassendi, the hater of hypocrisy and sham and affectation, was yet a great poet and an almost unrivaled master of the technique of the stage.

Jean-Baptiste Poquelin, who called himself Molière (1622-73), was a son of a valet of Louis XIII. In the Jesuit Collège de Clermont he learned to read the classics, and to love the philosophy of Lucretius and of Gassendi. An in-born taste for the theater led him to join a company of strolling players with whom he wandered through the provinces for thirteen years. After five more years at Paris he was appointed valet to the king, and for thirteen years made it his chief business to entertain the young and pleasure-loving monarch and his court by writing and producing the comedies that have taken so high a place in world literature. Knowing both lowly and lofty life at first hand, reading Italian and Spanish, he borrowed much, "taking his own where he found it," and making it his own by infusing into it a marvelous knowledge of character and a wonderful wit. Except the king and the priest, he brings every profession on the stage; and except the super-heroic, so amply supplied by Corneille, almost every type of character. The simple plots aim to disengage, analyze, and diagnose some particular type of character, as influenced either by profession or by temperament. The doctor, the bourgeois, the woman, the jealous husband, the *précieuse*, the miser,

the hypocrite, and the misanthrope are all held up to examination, and their maladies diagnosed and treated with a strong dose of satire.

In all things Molière's first aim was to please and to win the applause of the palace. In one of his plays ¹⁰ he sets forth this principle clearly:

The great proof of all your comedies is the judgment of the court; it is the taste of the court which you must study in order to succeed, for there is no other place where decisions are so just, and, even without taking account of all the learned men there, simple natural good sense and intercourse of polite society produce a sort of mind which, beyond comparison, judges of things more finely than all the rusty erudition of the pedants. . . . The great rule of all rules is to please; the drama which has achieved that end has followed a good road.

The high esteem in which the theater was held by all cultivated persons is witnessed by a hundred voices. As Corneille wrote: ¹¹

Today the stage
Is at the highest point, the idol of the age;
And though old men before our time looked down on it
Today it is beloved by every man of wit.
Paris is entertained; the provinces aspire
To share this gentle joy that even kings desire;
The people's chief delight, the pleasure of the great
Now holds the foremost place in festivals of state.

The change in Molière's style when he came to Versailles is marked. His earlier comedies, *L'Étourdi* and *Le Dépit Amoureux*, are intrigues in the Roman and Italian manner, in which the old men are bamboozled by their sons and servants and the young people marry happily. After he came to court Molière wrote a number of ballets and romantic comedies for the festivals there celebrated. But his ripest and best plays are satires on the various types with which the courtiers were familiar. Most people listen with

¹⁰ *Critique de l'École des Femmes*.

¹¹ *Alcandre*, Act v, Scene 5.

complacency to satire; for each man applies the point to his neighbor and enjoys the sense of superiority imparted by putting himself in the author's place, as the mocker and not as the mocked.

The first foible of Parisian society to be held up to derision in the new comedy was the affectation of culture by the women. *Les Précieuses Ridicules* are the euphuists who speak affectedly and judge everything by the standards of the romances, only to be shamefully taken in by valets masquerading as gentlemen. *The Bluestockings* pillories the women who dabbled in science and philosophy, with a direct reference to Mlle. de Scudéry's Saturdays.

Other types known at court, as elsewhere, and scourged by Molière, were the Bores (*Les Fâcheux*), the Libertines (*Don Juan*), and the backbiters. "Médisance," the vice of slandering behind their backs those whom the same persons flattered to their faces, was the subject of one of the greatest of our author's plays, and of one that bordered most nearly on tragedy. In *The Misanthrope* he shows how the life of a man can be blighted by his own sincerity and by the cringing flattery, injustice, and betrayal of others. Another type well known to the court and frequently satirized by Molière was the pushing social climber, the bourgeois or provincial who aspires to enter high society.

Though the great playwright's sarcasm was never savage it became almost so when he approached three types he especially abhorred, the quack, the miser, and the hypocrite. In a number of plays Molière pilloried the medical profession from which he himself, as a consumptive, had suffered. Not even Shaw has so soundly scourged the ignorance, the pretensions, and the jargon characteristic of the worst physicians. But in Molière's day there was much more to justify the satire than there is now.

In *Harpagon* the comic playwright describes the miser as the least human of all human beings, the hardest and most tight-fisted of all mortals, who holds the word "give" in such aversion that he never says "I give you good-day," but always "I lend you good-day."

In his satire on hypocrisy Molière reached the height of his art and aroused the maximum hatred from those who felt the lash. Tartuffe, the Elmer Gantry of the seventeenth century, is the hateful and ridiculous spiritual director who uses religion as a cloak for the indulgence of his appetites. In small matters he is scrupulous in the extreme, accuses himself of sin in killing a louse with too much anger, and begging the maid-servant, Dorinde, not to wear a low-necked dress lest the sight of her bosom should tempt him. But when food is set before him he gormandizes; when a pretty woman comes to him for spiritual counsel he tries to seduce her and to remove her scruples with every art of casuistry; when he wants money he swindles to get it and perjures himself to send his victim to prison as an enemy of the state. So keenly was the satire felt by the Company of the Holy Sacrament (commonly called the Cabal of the Pious) that they induced the archbishop of Paris to forbid the production of the play.

While Molière was diverting the court with brilliant comedies, Racine ravished it with beautiful and tender poetry. Just as taste was changing, and as the nobles and ladies of Versailles were turning from politics to love for their principal avocation, and as they were tiring of the heroic virtue and inexorable stoicism of Corneille, Jean Racine (1639-99) came to supply them with all that heart could desire of beauty, of pathos, of love, and of sweet sentiment. Born at La Ferté-Milon, the son of an official, educated at the college of Beauvais, the young poet spent three impressionable years at Port Royal. There he imbibed Greek, a love of letters, piety, and the Jansenist doctrine of the bondage of the will. In 1667 he won his first great success with *Andromache*. For ten years he wrote tragedies; then, converted from the life of the world to that of religion, and wounded by a slight from Louis XIV, he retired to Port Royal, never to write plays again except two on Biblical subjects, *Esther* and *Athaliah*.

Of his twelve plays one, *The Lawyers*, is a comedy partly modeled on Aristophanes's *Wasps*, and partly a satire on

French justice. The arguments of ten of his eleven tragedies are taken from ancient history or mythology; one from Greek history (*Alexandre*), three from Roman history (*Britannicus*, *Berenice*, *Mithridates*); and four suggested by Greek plays (*The Thebaid*, *Andromache*, *Iphigenia in Aulis*, and *Phèdre*), and two from the Old Testament. The plot of one play (*Bajazet*) is taken from recent Turkish history,—the author apologized for this by saying that distance of place would supply the perspective usually given by remoteness of time.

The motivating force in all the secular plays is romantic love. Men and women are depicted as slaves to this passion, and as unable to exercise voluntary choice. Woman is given the chief rôle; if Corneille could not paint a feminine character, Racine could hardly paint a masculine one. The conflict of passion is not, as in Corneille, between love and virtue, but between conflicting loves. Either two men contend for one woman or two women for one man. Love sways the destiny of empires; and love is stronger than death.

The two Biblical dramas, and perhaps some of the earlier ones, have reference to contemporary history. In *Esther* the persecuted Jews stand for the Jansenists, and the queen for Mme. de Maintenon. The hoped-for renaissance of Port Royal is prophesied in the words:

God is no longer wroth with thee,
Rejoice, O Zion, rise up from the earth;
Put off the weeds of thy captivity,
Resume the splendour of thy birth.

In *Athaliah* we have an allegory of the English Revolution of 1688-89. The usurping queen is Mary; and Joash, the heir of the rightful king, is the son of James II.

The supreme merit of Racine is his poetry. Sainte-Beuve called his work the center and perfection of all French poetry. The exquisite music, the harmony, the pathos, the purity of the language, the perfection of the form can be appreciated even by those to whom French is not the native tongue.

Compared with the French classic theater the English Restoration drama is a second-rate affair. In form it owed a good deal to French masters and something to Spanish; but in spirit it was the direct heir of the Elizabethans. Molière's plots were plundered by Davenant, Dryden, Wycherley, and others. Something was done to introduce the unities and rules, as Dryden wrote in a preface to *The Secret Love* (1668):

He who writ this not without pains and thought
From French and English theaters has brought
The exactest rules by which a play is wrought:
The unities of action, place, and time,
The scene unbroken, and a mingled chime
Of Jonson's humor and Corneille's rhyme.

What really formed the Restoration stage was the taste of the audience for whom it was written. While Shakespeare had played before a large, mixed public, Wycherley and Congreve appealed only to the cultivated and artificial world of fashion. Plot and action were narrowed to intrigue and incident. Character was painted from the life of the gentleman and his household. Wit was valued more highly than poetry, and clever conversation appreciated more than profound thought or emotion. What distinguished the Restoration theater above all was the cynical view of life that then prevailed as a reaction against Puritanism. Virtue and modesty were derided; obscenity saturated language and thought. Cuckoldry was the favorite subject of the public for whom good form had taken the place of good morals and elegance the place of virtue. These standards, as narrow in their way as were those of Puritanism, cramped the playwrights' criticism of life.

One of the most prolific dramatists of the period was John Dryden, who produced no less than twenty-eight pieces. Some of these were heroic plays modeled chiefly on Corneille; some were tragi-comedies, and some pure comedies. The plot of one was taken from Shakespeare; the plots of others from Calderón, Plautus, and Molière. Some

were histories, especially of the Far East or of the Spanish conquest of America or of Granada. *Amboyna* exhibits the atrocities of the Dutch in the East Indies in order to inflame the English mind to war with that rival nation. *Aurengzebe* borrows its plot from the life of the Great Mogul, still living when it was produced (1676). The *Indian Emperor* shows Montezuma, the last Aztec king, ruling with all the dignity and rhetoric of a Roman monarch, while his daughter and another princess contend for the love of Cortez. Somewhat more natural than his tragedies are Dryden's comedies, of which *The Rival Ladies* (1664) may be taken as an example. Two ladies in love with Don Gonsalvo de Peralta disguise themselves as pages to serve him, and fight a duel over him, fortunately without fatal results. The plot finds a happy ending by Gonsalvo's marriage with a third lady, and getting lovers for the other two.

More originality and wit than can be found in Dryden, and more cynicism and obscenity than can be found in almost any other playwright, made William Wycherley (c. 1640-1716) the favorite comedian of Charles II and his court. This libertine and man of the world produced in early life four comedies as a diversion, and then devoted himself to the serious business of drinking, drabbing and gaming, with no interruption except such as came from his marriage with a jealous and elderly heiress. His first play, *Love in a Wood* (1671) derives its fun from the confusion of the young people who, having made assignations in St. James's Park, meet the wrong persons. The Puritan is mocked in the person of Alderman Gripe, "seemingly precise, but a covetous, lecherous old usurer." The girls are all unchaste, the wives all untrue and "not so ill-bred as to love their husbands." *The Relapse* and *The Country Wife* are full of wit, ingenuity, animal spirits, and lust. The plot of the *Plain Dealer*, which Voltaire declared to be the wittiest comedy ever written, is taken from Molière, and one scene in it is almost translated from his *École des Femmes*.

Second only to Wycherley was Sir George Etherege, whose *Man of Mode, or Sir Fopling Flutter* (1676) created

one of the great characters of literature. The hero parodies the Frenchified coxcomb then so common in London society that Dryden declared:

Sir Fopling is a fool so nicely writ
That ladies would mistake him for a wit. . . .
Yet none Sir Fopling him or him can call;
He's knight of the shire and represents ye all;
From each he meets he culls whate'er he can;
Legion's his name, a people in a man.

Having gone to Paris a "plain, bashful English blockhead" he returned a "fine, understanding French fop" to make dress and gallantry the business of his life and to complain that "the world is too *grossier*" for his sort.

Among the playwrights of the time the ablest was William Congreve (1670-1729) who, after winning great successes in early life retired to the drawing-room of polite society to amuse the leisure of his last years. So admired in his own age that Dryden declared him to be the equal of Shakespeare, and Johnson pronounced him in some particulars superior even to him, he fell in the nineteenth century into general neglect, to be revived of late with considerable success.¹² His tragedy, *The Mourning Bride* (1697) contained fine poetical passages, and passed in its age as being very true to nature. His first comedy, *Love for Love* (1695) revamps the ancient plot of the gallant young son outwitting his old father, and introduces such characters as Foresight, an illiterate, peevish and positive old fellow ridden with superstition, Miss Prue, his daughter, an awkward country girl looking for a husband, Tattle, a half-witted beau vain of his amours, and Scandal who describes literary critics as pickpockets dressed as judges with catcalls in their hands and horn-books about their necks.

The masterpiece of English Restoration comedy, falling just short of Molière, is Congreve's *The Way of the World*

¹² I saw *The Way of the World* played at the Cherry Lane Playhouse, New York, on January 1, 1925. *Love for Love* was revived in New York the next year; and there have been numerous recent revivals of his plays in London.

(1700). In it Mirabell, the man of the world, wins the hand of Millamant, the rich, beautiful, and witty young lady, by playing a trick on her aunt, Lady Wishfort, for whom he provides a lover in his servant masquerading as a knight. Lady Wishfort is held up to ridicule as the hypocritical guardian of virtue who reads Bunyan and Jeremy Collier's attack on the stage. The perpetual gush of cynical sentiment at the expense of woman's virtue and man's honor is well summed up in the words of Witwoud: "A wit should no more be sincere than a woman constant; the one argues a decay of parts as t'other of beauty."

The Restoration drama is distinguished above almost all others for the absence of sympathy with anything outside of the futile lives of wits and men of pleasure. In vain does one look in it for any notice of the larger intellectual interests of the age of Newton and Locke; or for any comment, except a sneer, on its higher aspirations. Of "manners," indeed, in the sense of brilliance of conversation, grace, and wit, there was plenty; but of morals there was none.

Such plays as those of Wycherley, Congreve, and their fellows, at last aroused the slumbering sense of decency and honor outraged by the cynics. Sir Richard Steele declared *The Man of Mode* to be "a perfect contradiction to good manners, good sense, and common honesty," and to be "built upon the ruin of virtue and innocence." Jeremy Collier in *A Short View of the Immorality and Profaneness of the English Stage* (1698) attacked the comic dramatists for their profligacy and for their ridicule of the clergy and of the nobility. This may be said to have brought the Restoration drama to an end. A new style began in the eighteenth century. Shakespeare, little read in the seventeenth century, and regarded as "disgusting to a refined age,"¹³ began to come into favor again in the eighteenth. Sentimental comedy began to protest against the outrageous morals of the theater, and to praise home, family, and marital fidelity. It reflected not only the prudishness of the rising middle class but also their snobbishness. Money and

¹³ Evelyn: *Diary*, i, 358. Nov. 26, 1662.

rank are deferred to as next to godliness; a wealthy marriage is the good girl's reward.

A marked change came over the Spanish theater after the days of Cervantes and Lope. With less creative force than his predecessors Calderón had a poetical sweetness and a refinement that made him the darling of Shelley and of the German Romantics.

Pedro Calderón de la Barca (1600-81) sprang from a prosperous family of the lower Castilian aristocracy, and was educated first at the Jesuit college at Madrid and then at the University of Salamanca. After leading, for fifty years, a gay and gallant life as courtier and soldier, he became a priest. Like Aramis in Dumas's *Three Musketeers*, he made his avocations theology, dueling, and women. But his vocation was that of a playwright, and in this vocation he labored so seriously that he produced no less than one hundred and twenty formal plays and seventy *autos*, or short dramas on sacred subjects, chiefly on the mystery of the eucharist. The conventions, in his secular plays, are rigid. The masks are few, and fall into types so readily that the same names are used over and over again. The heroine is not only always superlatively beautiful, young, chaste, eloquent, devoted, and resourceful, but is generally named Beatriz or Leonor. The hero is always exaggeratedly chivalrous, amorous, and perfect. The old father is always austere, unyielding, perverse, and noble. The maidservants are always roguish and mendacious; the valets always faithful, cowardly, and comic. The mothers are always dead. The verse is always facile, abundant, rhetorical and, on suitable occasions, lyrical. One might add that the moral of the play, or its problem, is almost always the same—a vindication of the point of honor, or else of loyalty to the king or to the church.

And yet the dramas have much variety, because of the differences and ingenuity of the plots. Not for nothing had the author studied casuistry with the Jesuit moral theologians. Chastity and the point of honor were to him what chastity and virtue were to Sanchez and Escobar, the subject for

curious and intricate inquiry as to the application of the general rule to all conceivable cases. Typical of his plays is that called *The Physician of his own Honor*, which owed its popularity less to its tragic power and poetic beauty than to its doctrine of honor. The husband who believes himself deceived takes a revenge that seems to us inhuman and horrible, but which would have seemed to the first audiences noble and right, had the husband really been deceived. The real innocence of his wife provides the tragic element here, as it does in *Othello*.

Among the dramas dedicated to religion, *Chrysanthus and Daria* may be taken as typical. The scene is laid in Rome in the apostolic age. Chrysanthus, the son of a Roman senator, is discovered when the curtain rises reading the New Testament and meditating on the text, "In the beginning was the Word." Converted to Christianity he falls in love with Daria, a priestess of Diana, and converts her. The angry father arrests them both and sentences his son to prison and torture and the girl to become a prostitute in the temple of Venus. When she is taken there, Escarpin, the fool, comes to deflower her, but is thwarted by a lion. Under the escort of this virtuous beast she escapes to the wilderness and there meets Chrysanthus, who has also escaped. The happy ending is furnished, however, not by their marriage, but by their martyrdom, signalized by a storm and by the apparition of an angel. Of such a play one can hardly say that it was written agreeably to the rules and unities, or to any standards of probability; it is a chimæra, beginning like *Faust*, continuing like *The Rose and the Ring*, and ending like an *auto da fe*.

It was, in fact, the last burst of romanticism before the taste of the eighteenth century imposed the laws of the French drama on the Spanish stage. After Calderón Spain produced no playwright of the first rank. In Ramón de la Cruz y Cano (1731-91), however, she gave birth to a rival of Goldoni. His farces, written in realistic style, portray the common life of his people with a distinct love of the middle classes and a dislike of the nobles and clergy, whom

he almost always depicted in a hostile light, as ridiculous or odious.

The seventeenth century, so prolific of great drama in England, France, Spain and Holland, was almost barren in Italy. The eighteenth century, however, produced in that country two great masters of stagecraft in different styles. Pietro Trepassi, commonly called Metastasio (1698-1782) found his opportunity in the new opera, then called "melodrama," or "musical drama." As cultivated by Apostolo Zeno and by Metastasio, the word "melodrama" acquired the meaning of a sensational piece with a violent appeal to the emotions and a happy ending. Metastasio was born in Rome and educated in the Latin and Italian classics. Going to Naples in 1712, he studied law and wrote lyrics. His first melodrama, or opera, to win public favor, was *Dido Abandoned* (1721). The success of this and of other plays led to his call, in 1730, to Vienna as poet to the imperial court. Here, for fifty years, he continued to produce plays on classical subjects, such as *Cato*, *Alexander*, *Demetrius*, *Adrian*, *Achilles*, and *Semiramis*, but in a most unclassical style of a blood and thunder battle between a perfect and stainless hero and a black-hearted villain.

Very different was the style of Carlo Goldoni (1707-93), a son of Venice who began active life by studying law and writing an opera. From his early youth delighting in marionettes and in comedies, he soon turned to play-writing as his profession, and in it won such international fame that in 1762 he was called to Paris to direct the Italian theater there. Readily acquiring the French language he produced a number of plays in that tongue and in it wrote his delightful memoirs. The best of his two hundred and fifty stage pieces describe the Venetian life of his time. Like many of his contemporaries he began to see the admirable, instead of only the comic, side of the middle classes, whom he generally depicted in a favorable light at the expense of the patricians. Browning has happily characterized him in a sonnet:

Goldoni, good, gay, sunniest of souls,
Glassing half Venice in that verse of thine,
What though it just reflect the shade and shine
Of common life, nor render, as it rolls,
Grandeur and gloom?

Less widely known than are the theaters of England, France, and Spain, is the Dutch drama which, in the opinion of some critics, deserves to rank with them. Its great age, like that of its rivals, was the seventeenth century. The first theater had been the Amsterdam Chamber of Rhetoric, which was supplanted, in 1617, by a better building in Coster's Literary Academy. A still better playhouse, called the Schouwburg, was erected in 1637, and the greatest of all in 1664. The older Dutch drama consisted chiefly of shrovetide farces of Teutonic lineage. The rise of classical taste was marked in the dramas of Brederoo and Coster. The latter, an Amsterdam physician, created in Jan Hen a comic character sometimes compared with Falstaff. His tragedies became the vehicle for political and religious propaganda. A Libertine, like most other playwrights of that age, he scourged the ferocity of priestcraft and defended the state against the church in a play called *Iphigenia* (1617) depicting (as Lucretius said of an earlier Iphigenia) the evils done in the name of religion.

The greatest of all Dutch dramatists was Joost van den Vondel (1587-1679), who was born at Cologne of Anabaptist parents, and brought to Amsterdam, to enjoy religious liberty, at the early age of ten. Late in life, repelled by Calvinist dogma, Gomarist intolerance, and the excesses of the Puritan regicides in England, he became a convert to Catholicism. As early as 1618 the execution of the liberal republican statesman Barneveldt impelled him to write an attack on Maurice and the monarchical party in a powerful play called *Palamedes*. In later life, however, he became royalist in politics as he became more conservative in religion. Some of his lyrics celebrated the glories of the house of Orange, and some of his other writings attacked the

English Commonwealth. Some of his dramas were political, as, for example, one on *Mary Stuart or Martyred Majesty*. Others are Biblical, as, one on *Peter and Paul* and one on *Samson*.

His most famous tragedy, both because of its merits and because some have read into it a political allegory and others have seen in it a source of *Paradise Lost*, is *Lucifer* (1654). The story, treated by so many poets of that age, is that of the revolt of the angels and of the fall of man, as narrated in the Bible. Lucifer and his angels, "transgressing holy Law, once to the angels given," claim to be fighting in freedom's cause against the despot of the heavens. Though Vondel's thought may have been colored by reminiscences of the Dutch and English rebellions, it is hardly likely that, as some have thought, he intended to depict either William of Orange or Cromwell as Satan, or Philip II or Charles I as God.

The German drama in the seventeenth century followed the Dutch taste, but produced no master. In the eighteenth century a new dramatic theory was evolved and a new dramatic power evinced by Lessing, the first of the great German classics. Beginning as an admirer of the French school and a champion of the unities, he soon came to see that the contemporary French dramatists, especially Voltaire, while professing to observe the unities, really compromised with them by leaving the place indeterminate and by allowing more time than the conventional day. In a series of brilliant dramatic criticisms, called the *Hamburgische Dramaturgie* (1767-69) Lessing attacked the prevailing rules and proposed substituting for the narrow limits of place and time a harmony of tone in the creation of an ideal world. He further argued that the motivation of a play should not be external, as in fate, but subjective and internal, as in guilt. In this he was in harmony with the demands of the new age; for one of the most general of all the tendencies of modern literature is that which places the action more and more in the mind—the substitution of psychology for incident.

For better models than the French Lessing turned to the English theater, and less to Shakespeare than to his own contemporaries, especially Lillo, in whose *George Barnwell* he found the inspiration for his "bourgeois tragedy" *Miss Sara Sampson* (1755). In prose instead of heroic verse, choosing his characters from common, instead of from royal, life, the playwright depicts the seduction of an English baronet's daughter and the murder of the seducer by his deserted mistress.

Still somewhat melodramatic, but very moving and beautiful, is *Emilia Galotti* (1772), one of the most perfect of German plays. The argument, like so many of the plots of Corneille, is founded in one of those moral paradoxes that show human nature strained beyond the limits of ordinary pain and perplexity. The fable is that of the Roman Virginia, transferred to a modern Italian court. When Prince Hettore Gonzaga takes forcible possession of Emilia Galotti, and murders her betrothed, Count Apiani, her father, Odoardo, kills her, partly to keep inviolate her honor and partly to punish the seducer, of whom he says:

Enough for me if the murderer does not enjoy the fruit of his crime. This will torture him more than remorse. When satiety and disgust drive him from pleasure to pleasure, may the memory that he has not enjoyed this one pleasure embitter for him the enjoyment of all others. In every dream may the bloody bridegroom bring the bride before his bed, and when he stretches out his lustful arm to her, then may he suddenly hear the mocking laughter of hell and awake!

Among Lessing's other plays, one of the most famous, *Nathan the Wise*, teaches the lesson of tolerance, and another, *Minna von Barnhelm* (1763) is notable as the first truly German comedy, at any rate since the sixteenth century. The plot of *Minna* deals with the love of a poor but honorable soldier for a rich and beautiful girl and sets the whole action to the key of German manners in a German mood.

In the opinion of some critics the ablest playwright of

the eighteenth century was the Scandinavian Ludvig Holberg (1684-1754) said by his admirers to combine the art of Molière with the sophistication of Voltaire. Born at Bergen, Norway, he early mastered Greek, Latin, English, and French, and then studied theology and law at the University of Copenhagen. Traveling through Germany, Holland, and England, and matriculating at Oxford (1706), he came to know English men of letters and to admire English civilization as the freest and most enlightened. In 1718 he accepted the chair of philosophy at the University of Copenhagen, and about the same time began that extraordinary literary productivity of which Edmund Gosse says that it found Denmark without books and left her with a library. In addition to a mock-heroic epic and other poems, a history of Denmark and a history of the church, he produced a series of comedies unsurpassed both for their humor and for their skill in diffusing rational ideas. One of them, *The Arabian Powder*, satirizes alchemy, another witchcraft, and a third contrasts the too credulous and the too skeptical types. Another, *The Political Tinker*, ridicules the village statesman so taken up with public affairs that he lets his own business go to rack and ruin; and still another, *Erasmus Montanus*, derides the country youth who goes to the university for an education and returns home a pedantic prig, contemptuous of his simple parents and eager to instruct his neighbors in such recondite commonplaces as the Copernican theory.

CHAPTER XI

THE PROPAGANDA OF THE ENLIGHTENMENT

I. NATURE AND EXTENT OF THE POPULAR ENLIGHTENMENT

For the historian of culture the diffusion of ideas among the masses is not less important than the birth of ideas in the brains of individuals. Had the science of Newton, the philosophy of Locke, the historiography of Voltaire, and the Biblical criticism of Reimarus remained the esoteric doctrines of a small coterie, the Enlightenment would never have been, what it was, one of the cardinal emancipations of the human spirit. What makes it vie with the Hellenization of the world after Alexander, with the conquest of the West by Roman law and language, with the propagation of Christianity, with the Renaissance and with the Reformation, as a turning-point in human civilization is less the wonderful new ideas which it originated than the energy with which it diffused these ideas among the people. With an intensity of conviction almost religious, with a missionary zeal for the conversion of the masses, a chosen band of apostles set out to educate the public in the principles which, they believed, would prove as efficacious in the amelioration of the lot of mankind as they had been effective in explaining the operations of nature.

The god of the new religion was Reason; his chosen prophets were a band of writers known in France, where they chiefly flourished, as "les philosophes." The word "philosophe" does not mean "philosopher" in the ordinary English sense. The first *Dictionary of the French Academy* gave it, at the end of the seventeenth century, these three definitions: "1. A student of the sciences. 2. A wise man who lives a quiet life. 3. A man who by free thought

(*libertinage d'esprit*) puts himself above the ordinary duties and obligations of civil life." As the men who arrogated the name devoted much time to social reform, and as most of them were hostile to revealed religion, the word "philosophe" acquired the two connotations of "sociologist" and of "free thinker." In their own minds the *philosophes* were rationalists determined to imbue the world with a consciousness of the rights and powers of human intelligence. In the middle of the eighteenth century, *l'Encyclopédie* said: "To be a philosopher is to have solid principles and above all a good method for understanding facts and drawing legitimate deductions from them," and again, "to philosophize is to give reason its dignity." "A sect of bold philosophers," said Bachaumont, "seems to have a deliberate aim of carrying a fatal clarity into men's minds." Their purposes were practical as well as idealistic. Acting on the belief that "errors are none the better for being old," they attacked all institutions, particularly the religion in which they recognized the bulwark of irrational conservatism. "Do you know," asks Horace Walpole, writing from Paris in 1765, "who the *philosophes* are, or what the term means here? In the first place it comprehends almost everybody, and in the next, means men who are avowing war against popery and who aim, many of them, at the subversion of religion."

But the war on religion, classically expressed in Voltaire's war-cry, "Crush the infamous one," was only incidental to a broader purpose. The *philosophes* were men of genius intent upon applying to all social institutions and to all human prejudices the scientific abstractions worked out by the seventeenth century. What did not fit into their scheme was ignored, derided, and disbelieved. Whatever was susceptible of treatment by these abstract principles was made the object of an attack so successful as to yield them a brilliant triumph in the eyes of their contemporaries.

Far back in the seventeenth, or even in the sixteenth, century the seeds of this philosophy were sown. The battles of the Reformation and of the Jansenists shook the yoke of

opinion and authority. Descartes first effectively inoculated the body of public thought with the virus of rationalism. The growth of civil liberty in England, of tolerance in the Netherlands, and of "Libertinism" in France all loosened some bonds by which humanity had hitherto been tied. But the decisive factors in shaping the doctrines of the *philosophes* were the science of Newton and the psychology of Locke. Newton taught that all nature is founded in universal law, and that it can be understood and mastered by the human mind. Locke taught first that "the faculty of reasoning seldom or never deceives those who trust in it," and, secondly, that men are reasonable beings capable of using their own knowledge and intelligence for the promotion of their own happiness. The *philosophes* believed that it is sufficient, in order to make men happy and perfect, to enlighten them. A reasoned optimism was one of their prime qualities, an optimism based, however, not only on a doctrine but partly on their own experience. Becoming the darlings, the pets, and the idols of a large portion of the public they found, most of them, that life was good, and that its goodness was based, in large part, on the triumph of their own party. Even when they had personal disappointments, their optimism turned to resignation and to a belief in the general happiness of the world.

In English liberty, tolerance, science, and philosophy, the Enlightenment, as a distinct movement, was born. But it was in France that it attained its maturity as a popular, radical, and missionary movement. The evolution of the liberal party in France was largely the infiltration of English ideas into the thought of that country. A recent careful study of the periodical press in France has shown that from 1672 to 1700 the French public took little interest in England, and that that little was confined to politics and was mostly hostile. The next quarter of a century evinced some interest in English science, and the next a much increased respect for the science of the islanders and some appreciation of their literature. During the third quarter of the century this attention to all forms of British thought

grew into enthusiastic admiration. In 1724 was founded the *Club de l'Entresol* at Paris, to discuss foreign, and mainly British, ideas. A little later Voltaire trumpeted the merits of Newton and Locke, and in 1748 Montesquieu held the English constitution up to admiration. The works of Bacon, Hobbes, and Pope became well known, and the essays of Addison and other journalists were both translated and imitated.

The current of liberalism gathered strength as it went. The powerful, but isolated, efforts of Fontenelle and Bayle in the cause of popular enlightenment at the end of the seventeenth century became a "furious epidemic" of Voltaireanism by the middle of the eighteenth. Success gave the apostles of reason confidence and the momentum of the movement made them ever more radical. From Fénelon to Rousseau, from Bayle to Diderot and Holbach, we can see a perpetual progress towards revolution in politics and towards atheism in religion.

Many of the exponents of the new thought were quite conscious that they lived in a new era, and in one distinguished as much by the popularization of ideas as by their formation. In 1742 Hume blamed the seventeenth century for dividing "the elegant part of mankind" into two widely separated parts, the deep thinkers and the educated public, and praised his own century for bringing both parts together, to their mutual advantage.¹

Condorcet boasted of the age "when the human spirit moved in its chains, relaxed all and broke some; when all old opinions were examined and all errors attacked, when all old customs were subjected to discussion; and when all spirits took an unexpected flight towards liberty."²

Now is the time [proclaimed Holbach] for reason, guided by experience, to attack at their source the prejudices of which mankind has so long been the victim. . . . For, to error is due the slavery into which most peoples have fallen. . . . To error are

¹ Hume, *Essay on Essay-writing, Essays*, ed. by Green and Grose, 1882, ii, 367.

² *Œuvres de Buffon*, I, xlv. Condorcet's *Éloge de Buffon*.

due the religious terrors that shrivel men up with fear or make them massacre each other for illusions. To error are due inveterate hatreds, barbarous persecutions, continual slaughter, and revolting tragedies.³

Even those who, like Rousseau, hated their own age, admitted that it was "acclaimed for its enlightenment and fertile in wits," though it was "justly decried for its bad taste, and barren of geniuses."⁴

And the indifferent testified, at the end of the epoch, the wonderful success of the emancipators. Horace Walpole wrote:⁵

Since Voltaire took it into his head to be a philosopher, though of all men he is the least philosophic, people consider the affectation of philosophy a mark of brains, without thinking that when philosophy is affected it ceases to be philosophy. . . . When all the world was in darkness, perhaps it needed an effort to put oneself above prejudices; but what merit is there now in not having prejudices when it is ridiculous to have them?

Immanuel Kant first baptized the age with the name it now enjoys. The word "lumières," generally in the plural, was a favorite one with the *philosophes*. Kant translated it as *Aufklärung*, and defined it as "the liberation of man from his self-imposed minority" and declared that this coming of age had taken place in the generation just preceding his own.⁶

The high opinion of their own age and of their own services expressed by most of the *philosophes* was generally reversed in the age of Romanticism. Their age was then called "the century without a soul"; and Voltaire and his fellows were charged with having destroyed religion, the state, morals, and many other things held dear to the human heart. The later nineteenth century was more appreciative. Dr. Arnold called the Enlightenment "the seed-time of the modern world," and Lord Morley spoke of it as one of the

³ Holbach: *Système de la Nature*, i, Preface.

⁴ In 1751. Quoted by Hubert: *Rousseau et l'Encyclopédie*, 12.

⁵ *Letters of H. Walpole*, ed. by Toynbee, Supplement, i, 184 (1770).

⁶ Kant: *Was ist Aufklärung?* 1784.

major liberations of the human mind. Troeltsch has called the Enlightenment "the beginning and foundation of the properly modern period of European culture and history, in contrast to the theretofore prevailing ecclesiastical and theological culture."⁷

Now that twentieth-century science and thought has changed so many of our notions, the time has come for a new assessment of the doctrines, merits, and limitations of the eighteenth-century rationalists. One who, without prejudice or preconceived ideas, approaches them from the vantage-point of the present, will be rather surprised at their conservatism than startled by their liberalism; the historian who has some acquaintance with medieval as well as with the most recent thought will recognize in them as many vestiges of the past as anticipations of the future. In religion their Deism was a timid compromise and their atheism rare and unsure of itself. In ethics they never doubted the validity of most of the traditional maxims or the existence of absolute standards. In philosophy, too, the relativity of knowledge was an unborn thought. In politics few of them wished a revolution, and still fewer thought democracy possible in large states. The idea of progress was just being born; the idea of evolution, so determining of all our thought, was absent. Most of the scientific maxims of which they were surest have failed to stand the test of time. Heisenberg's "principle of indeterminacy" has played havoc with the axiom of the fixity of natural law, which is now regarded as no more than a calculus of probabilities. According to Sir James Jeans, the conception of nature as a great machine, so fundamental to the thought of the Enlightenment, "has failed dismally, both on the scientific and philosophical side."⁸

On the other hand, he who would argue that, because most of the ideas of the *philosophes* are now obsolete, their services to civilization were worthless, would be blind in-

⁷ E. Troeltsch: "Aufklärung," *Gesammelte Schriften*, iv, 338. This article was written in 1897.

⁸ *The Mysterious Universe*, 1930, 156.

deed. Even though their interpretation of nature, society, and philosophy is now outmoded, their allegiance to reason was both a noble and an immensely beneficent thing. To try politics, institutions, religion and ethics by the light of the best science of the time was better than to acquiesce in ancient oppressions and absurdities because they had descended from the dark and primitive ages. To Voltaire and his fellows we owe it that abuses were attacked, cruelties exposed, and absurdities shown to be such. The cloud of superstition which had darkened the Middle Ages and which had burst, in the Age of the Great Renewal, in a devastating storm of persecution and religious war, rolled away when the sun of reason rose and shone with all its strength. If we esteemed men by the happiness they have diffused and by the noxious oppressions they have destroyed, Voltaire and Diderot would be among the greatest saints of our calendar.

Nor was their battle easily won. Against them they had all the vested interests of society, and, in most countries, all the power of the government. Diderot's books were suppressed in France and he himself imprisoned; Buffon was forced to retract his views on geology; Voltaire was twice sent to the Bastille, and was obliged to live most of his life abroad; Helvétius's *De l'Esprit* was condemned and the author forced to sign recantations; Rousseau's *Émile* was burnt and a warrant issued for the author's arrest. Savage edicts decreed death to the publishers of unlicensed books, and condemned to the galleys, banishment, the pillory, and the whip, those who had bought or who had sold *La Pucelle* or *Le Christianisme dévoilé*. Great Britain, Prussia, and the Netherlands left authors and publishers much freer than did France, but far from perfectly free.

The literary attack on the liberals was constant and copious, nourished by every favor that the government, the church, the university, and the rich conservative could confer. In France most of the journals were hostile to the new ideas. Fréron's magazine, called at first *Lettres sur quelques écrits de ce temps* (1749-54) and later *Année littéraire* (1754-90) conducted a campaign against Voltaireanism.

With all the material weapons in the hands of their enemies the *philosophes* won a signal victory. By the connivance of a few powerful patrons, by the use of clandestine presses, by anonymity, and by flight from one country to another, they evaded the harsh laws aimed at them. They won by an appeal to public opinion, and by the superiority of their arguments and style to that of their enemies. In dramas, in epics, and in all the older literary forms, a new body of doctrine was packed. The novel, the newspaper, and the magazine, were at times used as vehicles of liberal ideas. The new prose style had been fashioned to express scientific and philosophical notions, and to appeal to the reading public. A favorite weapon of the innovators was ridicule; their chief advantage over their enemies lay in their wit. This satire was bitterly resented by those attacked. Berkeley ironically makes his freethinker Alciphron boast that his party had "the finest, the wittiest *railleurs* in the world, whose ridicule is the sure test of truth." "It is inconceivable," complained Warburton, "what havoc false wit makes in a foolish head." The favorite figure of speech of the infidels, he continued, is ridicule, or, rather, "low and mean buffoonery" adapted "to the level of the people."⁹

Though the press was the chief instrument of propaganda it was far from being the only one. The salons, or many of them, soon fell under the sway of the *philosophes*. It became fashionable to be liberal, cultured, and intellectual. Bewigged beaus and hoop-skirted ladies discussed momentous problems and turned over great folios like Bayle's *Dictionnaire*, or slipped *Candide* or *L'Homme Machine*, done in small duodecimos, into their pockets or under their pillows. Conversation must be clever, even though superficial. *Bons mots* were uttered and repeated on Newtonianism and on political economy; and wit fairly coruscated when the church was hammered. The *philosophes* learned to make metaphysics easy and agreeable, to write scientific

⁹ Warburton: *Divine Legation of Moses*, Preface to Freethinkers, 1738, i, 81.

treatises like novels, and to edit encyclopedias as readable and as timely as the latest newspaper.

The place of the French salons was taken elsewhere by the coffee house and by the club or fraternity. A surprising number of clubs were formed to drink coffee and punch and beer, to smoke and to exchange not only gossip but ideas. Most of them were merely friendly and were perfectly open in their meetings. Others were secret and were dedicated, more or less in the spirit of conspiracy, to the propagation of liberal religious and political ideas. The most famous, and probably the largest of these societies, was that of the Free Masons, founded in London in 1717. Though harking back to oriental cults connected by legend with Solomon, and though really owing something to the spirit of the English trade guilds and to Rosicrucian ideas and to those expressed by Comenius in his *Panegersia* (or *Universal Reveille*), this first Grand Lodge was really inspired by current liberal thought, attacking both kings and priests in the interest of a utilitarian, humane, and rationalistic program. The secret society spread with enormous rapidity: Paris had its first lodge in 1725, Florence in 1733, Hamburg in 1737, Berlin in 1740, Spain in 1726, Philadelphia in 1727, Boston in 1735, and St. Petersburg in 1771. The Masons were frowned upon by the state and still more by the church. In 1738 Pope Clement XII summoned men of all religions to join forces against this common enemy. While the lodge meetings did not go much deeper into philosophy than repeating platitudes, and though the plebeian element dominant in the society was generally ridiculed by the upper classes, the work of the Masons in educating the masses cannot be regarded as negligible.

Among the great instruments for diffusing a taste for reading and an interest in ideas, as well as for storing materials for the learned, must be reckoned public libraries. The foundation of the first of these has been described in a previous volume. During the period of the Enlightenment the public libraries kept by state and university were enlarged and rendered more useful to an increasing number

of scholars; but most of them were still jealously guarded from the encroachments of the vulgar. In the early eighteenth century in America, and a little later in Europe, were started many circulating libraries open to the public. These institutions, vastly popular, proved veritable fountains of intellectual enjoyment and improvement for the masses.

In France the great *Bibliothèque du Roi*, admirably managed by the Abbé Bignon for twenty-five years (1718-43) added to the already large collections many new books, manuscripts, medals, and inscriptions. At his instance the library was transferred from its small house in the Rue Vivienne to the Hôtel de Nevers on the site where the *Bibliothèque Nationale*, as it is now called, still stands. Among the libraries and museums in the provinces the best was that founded at Aix about 1735 by Dom Malache d'Inquimbert. Of these collections Voltaire said:

The library is one of the noblest of institutions. There has never been an expenditure more magnificent and more useful. The public library of the French king is the finest in the world; less as to number and rarity of volumes than in the facility and politeness with which the librarians lend them to all the learned. The collection is unquestionably the most precious monument there is in France.

In 1714 Antonius Magliabbechi—whose name was turned into the anagram, "Is unus bibliotheca magna"—left thirty thousand books to the city of Florence. This collection formed the foundation of the famous *Magliabbechiana* which, with the *Laurentiana*, or, library of Lorenzo de' Medici, was opened to the public in 1741.

The Spanish government paid some attention to the royal library—now the *Biblioteca Nacional*—arranging and increasing the materials, and making them accessible to qualified persons in 1714.

No library in Germany flourished more during the late seventeenth and early eighteenth century than did that of Hanover, presided over by Leibniz. Laboring to increase the number of books on theology, law, science, philosophy,

fair letters, and history, he thought he had acquired nearly enough for study of all these branches by 1679, when he wrote Duke John Frederick:

In my opinion a library should be an encyclopedia; that is, a place where anyone can get instruction in all matters of importance or of possible interest.

The foundation of the British Museum has been described in a previous chapter. Even in the eighteenth century it began to acquire those vast collections that have made it, in our time, the largest library in the world. To the gifts of royalty were added the legacies of many private collectors, of whom the most notable was Sir Robert Cotton. These collections, however, were then kept closed to all but a favored few. Public circulating libraries were started in England about 1750; and they were much patronized by all classes. Then, as now, fiction was the branch of literature most in demand; and then, as now, young women were its chief readers. The older generation looked at the purveyors of books very much askance. In a "dramatic novel in one act," entitled *Polly Honeycomb*, published by George Colman in 1760, young Polly is represented as a great patron of circulating libraries, and as a girl whose head was so turned by fiction that she eloped with Scribble, a rogue posing as an author. Her old father ruefully comments:

A man might as well turn his daughter loose in Covent Garden [then a resort of vulgar amusement-seekers] as trust the cultivation of her mind to a circulating library.

And doubtless many another crusty old father agreed with Sir Anthony Absolute (in Goldsmith's *She Stoops to Conquer*) that "a circulating library in a town is as an ever-green tree of diabolical knowledge—it blossoms through the year."

The first libraries to be freely opened to a wide public were those of democratic America. In 1700 municipal libraries were founded in both Boston and New York, and others in other cities not many years later. In 1731 Frank-

lin started a fund for a library in Philadelphia, getting fifty subscribers to contribute forty shillings each, and to promise ten shillings annually for fifty years. In his *Autobiography* he related that

We afterwards obtained a charter, the company being increased to one hundred; this was the mother of all the North American subscription libraries, now so numerous. . . . These libraries have improved the general conversation of the Americans, have made the common tradesmen and farmers as intelligent as most gentlemen from other countries, and perhaps have contributed in some degree to the stand so generally made throughout the colonies in defense of their privileges.

So great was the success of Franklin's institution that it was widely imitated. By 1763 there were no less than twenty-three public libraries scattered all through the thirteen colonies. Though not large, the collections often contained solid works. In 1760 the Social Library of Salem numbered among its eight hundred volumes the publications of the British, French, and Prussian scientific academies.

The hardest question that the historian of culture has to answer is the extent of the public moved by the new ideas and won for them. The large majority of mankind is almost untouched by intellectual interests even now; and a still greater proportion was sunk in a still deeper apathy two centuries ago. The readers of newspapers and books did not, in large part, draw their intellectual nourishment from the leaders of thought. Most of the journals talked of harvests, gout, children, prices, and gossip; occasionally of politics; more rarely of plays or poetry; and most rarely of all of Voltaire and Rousseau. The most read books were still the novels and the school-books from which the populace of all reading ages has taken its notions and sentiments.

There remained, however, a considerable and powerful minority of highly intelligent readers who were in large part won by the rationalists, or at any rate tinctured with their doctrines. How large this public was it is impossible to say. Frederick the Great estimated the readers of Vol-

taire throughout Europe at 200,000. Seven editions of the *Encyclopédie* were called for before the end of the century; nineteen editions of Voltaire's complete works between 1740 and 1778, and a much larger number of editions of some single works, like *Candide*; eighteen editions of Rousseau's works were published before 1789, and no less than fifty editions of the *Nouvelle Héloïse*. But, after all, the important thing about this public was not its numbers but its weight. Practically all revolutions have been carried through by minorities. H. G. Wells¹⁰ estimates the "understanding and competent minority" upon which "depends the whole progress and stability of the human enterprise" at the present time at about a million. If, in the eighteenth century, this competent and understanding minority really numbered two hundred thousand, it would fully account for the cultural revolution known as the Enlightenment.

2. "LES PHILOSOPHES"

As those writers who were called *philosophes* had no party organization, no association, and no common program, as they were often mutually hostile, and as their doctrines showed all degrees of radicalism and all shades of variety, it is impossible to distinguish them sharply or to enumerate them exactly. There were elements of "philosophy" in the more liberal clergy, like Fénelon; there was a strong tincture of it in economists like Turgot and in political and historical writers like Condorcet. Most of the eminent scientists of France, even when, like Buffon, they were rather opposed to the more pronounced principles of the Voltaireans, contributed to the Enlightenment by destroying errors in metaphysics and by multiplying truths in science. The materialists, La Mettrie, Holbach, and Helvétius, were not only of the philosophic sect but even constituted its left wing. Among the first to attack the old errors and to diffuse the new idea among a wide public, a high place should

¹⁰ H. G. Wells, J. S. Huxley and G. P. Wells: *The Science of Life*, 1931, 1469.

be given to Fontenelle, the popularizer of science and the exponent of the idea of progress.

But among the major prophets of reason the oldest was Pierre Bayle (1647-1706), the son of a Huguenot minister at Carla in the extreme south of France. After attending a Protestant academy not far from his home, he entered the Jesuit college at Toulouse, in 1669. Converted almost at once to Catholicism, he returned within a year, at least nominally, to his father's sect. Obligated, as a relapsed heretic, to leave France, he turned to Geneva. Presently he began to teach school at Sédan. About 1681 he migrated to Holland, where he spent the rest of his life.

His masterpiece was the *Dictionnaire historique et critique* published in large folios in 1697. His first plan, to make a list of errors and omissions in Moréri's Dictionary of the Bible and in other similar works, gave place to the more comprehensive scheme of a general historical reference book. Even so, though he offers a good deal on secular subjects, his favorite field is that of Biblical and ecclesiastical history. Long articles on Adam, Aaron, David, and on the Jewish patriarchs and prophets and on Christian saints and theologians and bishops, almost invariably contrive to throw doubt either upon the reliability of the sources or else on the moral character and religious merits of their subjects. Though on the whole more favorable to the Protestants than to the Catholics, he does not always let them off easily. His article on Catherine von Bora, Luther's wife, repeats both the Catholic scandal and the Protestant eulogy of her, leaving the reader in some doubt whether she was a wanton or a perfect woman. The copious notes to the various articles, which often exceeded in bulk the matter in the narrative, displayed the author's learning to advantage and often pointed sharply the doubt insinuated in the text. In many cases his criticism was sound and brilliant; in almost all it was worth considering by the scholar and stimulating to the general reader. At times Bayle yielded to the temptation to bend his sources to his bias. The bitter attack on Augustine hardly does justice to the merits of that remark-

able man. The scandal repeated, even when not credited, by the author could not fail to damage the characters of many of his subjects more than they deserved. Goethe had some reason for declaring the *Dictionary* "equally valuable and useful on account of its learning and acumen, and ridiculous and noxious because of its gossip and twaddle."¹¹ Voltaire justly branded it as "anecdotes about everything." It was, indeed, capricious in the selection of material and in its treatment.

There is no doubt about the enormous popularity and effect of the work. From it, as from an arsenal, Voltaire and his successors drew their choicest weapons. As the best work of reference of its kind then in existence, it found its way into many private libraries. Mornet found it in 288 of the 500 private libraries of the early eighteenth century which he examined—oftener than any other book.

The greatest name among the *philosophes*, and one of the greatest in all literature, is that of Voltaire. He was the spirit of the Enlightenment incarnate, with all its virtues and all its faults. The literary dictator, the arbiter of intellectual fashion, the model of style, the cosmopolitan citizen of the Republic of Letters and the idol of all the most advanced liberals, he was yet a passionate reformer, and a savage enemy of the Roman church. A dramatist, a wit, a mocker, and a passionate critic of his age, he yet took a world-wide view, evinced much fertility in ideas, cherished warm sympathies with the most advanced science and history of his time, and developed matchless skill in propaganda. He knew what he wanted, and he knew how to get it. He hated injustice, cruelty, and hocus-pocus, and he knew them when he saw them. He attacked all the institutions of his time inimical to liberty of thought. He was imposed on by no authority and by no sanctity, and he had few or no doubts of the beneficence of his gospel. When he was asked what he would put in the place of the superstition he had destroyed he replied: "I like that! When I

¹¹ *Aus Meinem Leben*, Book XVIII.

have delivered the race from the ferocious beast that devours it, I am asked what I shall put in its place!"¹²

Voltaire's life (1694-1778), which was almost conterminous with the period of the Enlightenment, may be conveniently divided into two parts by his withdrawal from Berlin, after a quarrel with the king of Prussia, in 1753. After living at Lausanne, and near Geneva, in Swiss territory, he bought, in 1758, the estate of Ferney, in French territory very near the Swiss border, and from there he issued his propaganda. Until about this time he had been regarded as a great poet and dramatist; from henceforth he figured in the eyes of Europe as the great historian, philosopher, and pamphleteer. So enormous was his influence that Ferney became the capital of one of the Great Powers of Europe,—the Republic of Letters. The mighty king of Prussia treated with him as one power with another. The oppressors of France let go their victims when he took their part. The empress of Russia, who feared not to outrage the morals of Europe by murdering a husband and taking a regiment of lovers, thought twice before she did anything to excite the risibilities of Monsieur de Voltaire.

The objects of his satire were not always well chosen. The freethinker of today will find little point and much bad taste in the play made by Voltaire with the whoredoms of Aholah and Aholibah (Ezekiel XXIII) or with the reflections on the conception of Jesus that he put into the mouth of Frater Pediculus (Brother Lousy). His obscene mirth over Jeanne d'Arc and her virginity is extremely painful. But these are samples of his worst manner. In general, his wit and his reason were dedicated to the causes of humanity and enlightenment. "To crush the infamous" was what he not only aimed at, but what he generally achieved.

His principles were few and simple. He had no taste for metaphysics, believing that common sense is enough to guide a man in all problems of life and of the universe. He did believe, profoundly, in the physics of Newton and in the psychology of Locke. He believed in tolerance, personal

¹² Casanova: *Mémoires*, iv, 469.

liberty, freedom of thought, and the civil rights guaranteed in the English constitution. He believed in a natural religion, that renounced free will, accepted materialism, worshiped a rather distant and shadowy First Cause, and half accepted the idea of immortality as a consoling and useful doctrine. He believed in pleasure and in its pursuit unrestrained by Puritanical laws or ascetic scruples. Next to Newton and Locke his chosen masters were Montaigne and Bayle.

With almost unexampled fertility he poured forth a stream of conversation, letters, essays, histories, plays, epics, lyrics, scientific treatises, romances, and jokes to drive his ideas into the mind of Europe. Everything he said and wrote was as stimulating as the coffee on which he lived. “His conversation,” reported Boswell, “is the most brilliant I ever heard. It was very serious conversation. . . . I said to myself, ‘aut Erasmus, aut Diabolus’—he is either Erasmus, or the Devil.”¹⁸

His correspondence, of ten thousand letters, is one of his masterpieces. In it he cajoles, he indoctrinates, he caresses, he inflames. His poems, somewhat stilted and prosaic as they appear now, were much admired at the time. Whatever their subject they all inculcated the writer’s favorite notions. The *Henriade* is an epic in praise of Henri IV for his religious tolerance. His mock epic, *La Pucelle*, introduces into a poem on Jeanne d’Arc the names of Galileo, Descartes, Newton, and “a fool called Ignatius Loyola,” puts in hell the persecuting saints and “the ferocious Calvin,” and preaches the gospel of Venus and of pleasure.

Voltaire’s *Letters on the English*, which he described as “philosophical, political, critical, poetical, heretical, and diabolical,” in the guise of explaining England to France, demanded liberty to think and write, held up to admiration ideals of comfort and prosperity, and inculcated hardy irreligion, historical criticism, notions of hygiene, and scientific materialism. Much the same ideas inform the *Philo-*

¹⁸ Letter to Rousseau, 1764, *Letters of J. Boswell*, i, 66.

sophical Dictionary, an imitation of Bayle conveniently published in pocket editions.

Equally propagandist and even more effective were the numerous plays of all sorts, comedies, tragedies, and operas. In form they are imitations of Corneille, Racine, and Molière, and rather formal and frigid imitations. To the reader who looks for passion and poetry they are disappointing. Like school exercises they borrow their most effective lines and sentiments. The rules are the old ones of the unities of time, action, and place. The subjects, too, are largely taken from the traditional fields. The tragedies are nearly all set in ancient times or in exotic lands. *Œdipe*, *Mariamne*, *Brutus*, *Ériphyle*, *Le Mort de César*, *Mérope*, *Semiramis*, *Oreste*, *Catiline*, *Socrates*, *Olympie*, *Le Triumvirat*, *Sophonisbe*, *Les Pélopidés*, *Les Lois de Minos*, and *Les Guèbres* are all taken from classical mythology or history. The scene of *Alzire* is laid in America, that of *Zaïre*, *Zulime*, *Le Fanatisme ou Mahomet le Prophète*, and *L'Orphelin de Chine* in the Orient. A very few plays are founded on French medieval history or on the Crusades. The comedies treat ordinary, middle-class life in a farcical spirit. The operas draw their plots from classical or Biblical subjects, except the *opéra bouffe* called *Le Baron d'Otrante*. But, however old their form, their content is new—an eternal driving home of the evils of intolerance and fanaticism and superstition and priestcraft, and an eternal suggestion of the blessings of broad-mindedness and common sense and humanity and pleasure.

Not less popular and propagandist than his plays were his novels or short tales. *Zadig* tells the story of a virtuous and enlightened Babylonian of ancient times but of Voltairean principles. Becoming doubtful of the merits of the Babylonian religion he attacks the custom of burning widows on the pyres of their husbands, remarking that though the custom has been in force for a thousand years "reason is more ancient still." Hearing disputes on the origins of the world and of civilization he comes to the conclusion that all traditions about them are doubtful, and that all

religions are in essence the same. At the time he wrote this story (1748) Voltaire was an optimist, regarding partial evil as universal good. When he introduces an angel disguised as a hermit burning a house so that his host will find a treasure buried under it, and killing a youth because he foresees that, had the youth lived, he would have become a murderer, the author takes what might be called, in anyone but a Deist, a Sunday-school view of the operations of Providence.

In *Micromégas* he plays off the ideas suggested by the new astronomy by telling the story of a gigantic inhabitant of a satellite of Sirius who visits other worlds, in some of which he discovers creatures much larger and in others beings infinitely smaller than himself, but learns that all of them cherish the human illusion that the universe has been made for them.

Another point of vantage from which the philosopher of Ferney brought to bear upon his own society an external criticism was found in *L'Ingénu*, the tale of a white child raised by the Hurons, who comes to France. His natural candor and simple morals collide with the artificiality of a corrupt civilization. Finally the narrative comes to a tragic end, when the hero is imprisoned on a frivolous charge and his beloved prostitutes herself to a minister.

Next to his histories and his letters *Candide* must be reckoned Voltaire's masterpiece. This really great, though terrible, story satirizes the easy optimism of Leibniz, which was no longer acceptable to the aging author. The hero of the tale, Candide, is the son of a German baron, and is educated by Pangloss (a disciple of Leibniz) in "metaphysicocosmolonigology" to believe "that there is no effect without a cause, and that this is the best of all possible worlds." His philosophy is put to the severe test of experience when the Bulgars sack his uncle's castle, ravish his beloved, and oblige him to flee in fear of his life. His adventures for the next few years make him familiar with war, flogging, the plague, earthquake, shipwreck, and the vices, follies, and miseries of mankind. Travels throughout the

world show him the same tragedies set on various stages. Finally he asks his friend Martin:

"Do you think that men have always massacred each other as they do now? that they have always been liars, scoundrels, envious, gluttons, drunkards, greedy, ambitious, bloody, perfidious, ungrateful, brigands, weaklings, fickle, cowardly, slanderers, debauchees, fanatics, hypocrites, and fools?" "Do you think," replied Martin, "that hawks have always eaten pigeons when they have found them?" "Yes," said Candide. "Well," replied Martin, "if hawks have always had the same character, why should men change their character?"

At last, after many wanderings, Candide settles down to cultivate vegetables in his little garden on the theory that "to work without thinking is the only way to make life supportable." This is the final conclusion of Voltairean, and perhaps of all worldly, wisdom.

Whatever the merits or the faults of the philosopher of Ferney, there is no doubt about his enormous popularity. Within a period of seven years, Lanson calculates, a million and a half of his books were sold. His reputation was enhanced with the reading public by the continual denunciation of him, by the pundits, as shocking and dangerous. Next to his own country Germany admired him most. On his death Frederick the Great gave him a splendid eulogy before the Prussian Academy. Lessing wrote for him the following epitaph:

May God forgive him, of his grace
His *Henriade* and verse and plays;
The other things he brought to light
Are tolerably good and right.

Goethe, though as a youth repelled by the partisan unfairness of Voltaire and by his defacement of many noble objects, came to regard him as "the greatest writer possible to imagine among Frenchmen" and "the most marvelous of nature's creatures." The pious, the romantic, and the conservative were unspeakably shocked by him. The attack

was led by Albrecht von Haller, who wrote a book against him and who said of him: ¹⁴

Voltaire's spite, his distortions, his horrible objurgation have given me infinite disgust. . . . His argument has nothing solid in it, but consists of endless repetitions, and a bitterness against God and Jesus, not to mention the Jews, which is intolerable to me.

In England the French rationalist had his warm admirers and his bitter enemies. Horace Walpole wrote to him, doubtless with perfect sincerity: ¹⁵

Nor do I fear you, Sir, only as the first genius in Europe, who has illustrated every science; I have a more intimate dependence on you than you suspect. Without knowing it, you have been my master; and perhaps the sole merit that may be found in my writings is owing to my having studied yours.

On the other hand the moralists, the poets, and the timid generally disliked or feared him. Dr. Johnson thought him worse than a felon. Sir Joshua Reynolds painted him, in an allegorical picture, as Sophistry. Gray could not hear his name with patience; for, though he admitted his genius, he thought him vile. Some, who privately agreed with his doctrines, deemed it dangerous to spread them indiscriminately among the masses: if Voltaire really despised men as fools and children, why did he put dangerous explosives in their hands? So Lord Chesterfield, himself embarrassed by no old-fashioned scruples, could not pardon the Frenchman for propagating ideas dangerous to civil society and to established religion.

In America Voltaire was read in the original and in translation. I have in my possession a copy of the *Philosophical Dictionary* in an English version printed at Catskill in 1796. This copy was bought, soon after its publication, by my great-great-grandfather, Preserved Smith, then a Unitarian clergyman in Massachusetts. Though the trans-

¹⁴ *Briefwechsel zwischen Haller und Gemmingen*, 1899, 86, letter of Nov. 18, 1775.

¹⁵ *Letters of H. Walpole*, ed. by Toynbee, vii, 200; June 21, 1768.

lator has compressed the work a good deal, and has omitted indecencies and some otherwise objectionable passages, he gives on the whole a very good representation of the ideas of the original, which he praises, in a preface, as showing humanity and benevolence, and which he recommends to Christian apologists as setting them the arguments they will have to refute.

In Italy, as elsewhere, Voltaire was read, enjoyed, assimilated, and denounced. A characteristic article in the best Italian journal, the *Novelle Letterarie* in 1766, declared:

Voltaire and Rousseau are equal in impiety and have done more harm to religion than all the other infidels together from the birth of Christianity to the present. But Rousseau sins by a mixture of ignorance and pride, Voltaire by malice and wickedness.

The only rival to Voltaire as a disseminator of the seeds of enlightened principles was not a man but a coöperative enterprise, the famous *Encyclopædia*. The chief editor and inspiring genius of this was Denis Diderot (1713-84) the son of a cutler of Langres. As a brilliant student of the Jesuits at the College of Louis-le-Grand he early began to detest the religion and to love the literature taught by his masters. His religion oscillated between theism and atheism according to the state of his nerves: he was an atheist by day and a theist at night. For many years his passionate love of letters brought him only poverty and persecution; but at last it gave him fame, the patronage of the great, including Catherine II of Russia, and wealth. His mind was perhaps the most seminal of any of his group. Whereas Voltaire's originality was slight, and Rousseau's was mostly destructive, Diderot's mind broke new paths to many untraveled domains. He was among the first of psychological novelists, of evolutionary biologists, and of consistent philosophical materialists. His artistic criticism was newer, his science better assimilated, and his principles both in religion and politics more radical than can be found in any of the other *philosophes*. His versatility was remarkable. Be-

sides novels, comedies, essays, and poetry, he contributed many pages to Holbach's *Système de la Nature*, and he edited the most important and influential encyclopædia ever published.

The idea of bringing together in a single work of several volumes a convenient summary of human knowledge was by no means a new one. Such works had been supplied in the Middle Ages. Such was the seven-volume *Encyclopædia*¹⁶ published in Latin by Johann Heinrich Alsted at Herborn in Nassau in 1630, and Louis Moréri's *Grand Dictionnaire historique* in 1674. Such a work was Bayle's *Dictionnaire historique et critique*, already described. Such a work was Ephraim Chambers's *Cyclopædia* published in two volumes in Britain in 1728. Such was the *Great, complete, universal Lexicon of all Sciences and Arts*, largely edited by J. H. Zedler and published in sixty-four volumes during the years 1732-50, with four volumes of supplements later.¹⁷ This last was a truly remarkable work, comprehensive, learned, and reliable according to the standards of its time. But it lacked the literary finish and the liberal intention that made its French rival a landmark in the history of culture.

The French work owes its inception to the wish of a publisher to translate Chambers's *Cyclopædia* into his own language. When he approached Diderot, then not much more than a superior literary hack, the latter took up the idea with enthusiasm, expanded it, and made it very largely a new thing. Not entirely new, indeed; for his encyclopædia, like almost all others, was more dependent on its predecessors than the editor admitted. A good deal was copied from Chambers; a good deal from Brucker's *Latin History of Philosophy*, a voluminous and recent work then enjoying a high reputation. Bayle was pillaged, and so were some other special dictionaries. Doubtless other debts could be discovered by careful search.

¹⁶ *Encyclopædia septem tomis distincta.*

¹⁷ *Grosses vollständiges Universal Lexicon aller Wissenschaften und Künste.*

Nevertheless there was much that was original and brilliant in the execution of the whole. The purpose of Diderot, and of his associate d'Alembert, was to get for every subject the best specialist; to assign the articles on mathematics to a mathematician, those on philosophy to a philosopher, those on grain to an economist, and those on religion to a theologian. In fact, the most illustrious men of the time contributed but little. Buffon contributed almost nothing, though his collaborator, Daubenton, gave many articles. Holbach wrote on chemistry and mineralogy; Rousseau on his specialty, music, and also on political economy. Voltaire furnished a few prudent literary articles, including the one on "History." Turgot and Quesnay had some articles on economic subjects; Montesquieu one on "Taste." D'Alembert wrote many of the scientific articles for the first seven volumes, and then gave up. Diderot wrote much himself, particularly on trades. The bulk of the work was done by hacks, and was of mediocre quality, repeating earlier work, without fresh research. There were no biographical articles.

With all its limitations the plan was ambitious and the achievement remarkable. Though less diverse and profound than it is today, human knowledge was then a vast and intricate complex. In order to furnish a general plan, d'Alembert contributed a long preface on the connection and nature of the various arts and sciences. This was followed by a graphic plan of the System of Human Knowledge, dividing the whole according to Bacon's scheme into three parts depending on the faculties of memory, reason, and imagination. Under memory are classified history, natural history, crafts, trades, and manufactures; under reason are placed philosophy (divided into theology and psychology), mathematics, and physics. Under imagination is put poetry in its various branches and with its allies.

In the assignment of articles and in the treatment of material the editors made a brave, intelligent and, with some exceptions to be noted presently, a fairly well sustained effort to maintain a critical and scientific attitude and

to free themselves from the prepossessions of the past. The articles on science show the subject nearly purged of magic. The experimental method is insisted on. An extraordinarily large amount of space is given to trade, industries, and machinery. The latest views of political economy are adopted. The industrial revolution is at least adumbrated, if not recognized. The analysis of feudalism is devastating. The happiness of the working man is proclaimed as the end of good government.

The historical and political articles are conservative; those on religion perfectly orthodox. The Old Testament chronology and mythology are accepted. The article "Christianity," by Diderot himself, appears to be the work of a good Catholic, complacently, or prudently, accepting all the dogmas of the church. Most of the other religious matter was supplied by churchmen, of whom Morellet was the most famous and perhaps the most liberal. The lack of overt polemic against dogma and the timidity of the rationalist position disappointed the Voltaireans. But the semblance of orthodoxy was absolutely necessary to evade the censor.

And, after all, a good deal of free thought and covert satire was slipped in by indirection. Superstitions like astrology and the belief in amulets were rebutted. Insolent allusions to sacred matters were concealed in unlikely places. Indirect polemic, apparently aimed at heathen religions, carried attacks on Christianity to those who could read between the lines. The article "Agnus scythicus" discussed the principle of authority; that on "Aius Locutius" (a Roman god) pleaded for liberty of thought; that on "Juno" cast doubt upon the legend of the Virgin. The Franciscans are praised in the article "Cordeliers" but mocked in the article "Capuchon" (hood). The translator of the article "Aigle," which is mostly taken from Chambers, added reflections on religion. The article "Gomariste," by Morellet, explained the principles of tolerance. The advertisement of the eighth volume, by Diderot, proclaimed aloud his pur-

pose to fight intolerance as "a giddy spirit repugnant to the peace of society" and as "an abominable injustice in the eyes of God and of men." In still another way the editors' calculated tactic of a "silent war on the vast domain of error" was found practicable, and that was by reducing the amount of space given to religion and by allowing a liberal treatment of more secular matters. The article on the stocking-knitting frame was ten times as long as the article on cathedrals. Sciences and trades were expounded at length; creeds and confessional controversies dismissed in a few perfunctory lines.

In July 1751 the first volume was published under the title *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts, et des métiers, par une Société de gens de lettres*. Though the royal license, granted in 1746, had guaranteed freedom from civil and ecclesiastical interference, the enemies of the project attacked it so successfully that twice during the course of publication the license was revoked. The first revocation, in 1752, frightened the assistant editor, Le Breton, who began, unknown to Diderot, to mutilate the manuscripts sent in by eliminating what seemed to him dangerous. After permission to print had been restored, a second suppression, in 1759, frightened away d'Alembert. Diderot's tireless industry, skill, and courage, finally brought the work to completion in seventeen volumes of text and eleven volumes of plates, the last volume of the text being printed in 1765, the last volume of plates in 1772.

Notwithstanding its high cost the *Encyclopédie* was widely read. The 4,300 subscribers to the first edition were mostly magistrates, abbés, and functionaries. Six new editions were called for in rapid succession. The work became the foundation of a gentleman's library. It contributed much to change the tone of thought. The advertisement of the edition of 1781 says:

This truly philosophical work necessarily accelerated the progress of reason; for some years we have advanced with giant strides along the path made by these authors.

Two other encyclopædias deserve mention as attempts to do in a conservative spirit what Diderot had done in the most liberal manner open to him. The first edition of the *Encyclopædia Britannica* was published in three volumes at Edinburgh 1768-71. The *Encyclopédie Suisse*, published at Yverdon, 1770-80, was written from the standpoint of Protestant Pietism. On the scientific side it was strengthened by the contributions of Haller; on the religious side it was ultra-conservative, as a conscious protest against the rationalism of Diderot.

A democratic revolution in the Republic of Letters, though not accomplished until the political revolutions in America and Europe had prepared the way, was, like them, foreshadowed and prepared in the Age of the Enlightenment. As Voltaire and Diderot had been main instruments in the popularization of the scientific revolution, so the last of the major *philosophes*, Jean Jacques Rousseau, was the first great prophet of the democratic revolution in all domains of culture. By temperament and training he was ideally fitted to be spokesman of the wrongs and grievances of the oppressed, and of their passionate protest against the rule of the world by and for the higher classes. These grievances and these protests were as much spiritual as material. The sense of social inferiority incidental to poverty inflicts as much pain as does its penury; the envy of the intellectual advantages and sure standards of the educated excites as much rancor in the breasts of the disinherited classes as does their desire for material luxury.

Rousseau powerfully expressed all these wrongs and grievances and dared strongly to attack the rules of society by which the poor were put at a disadvantage. His natural timidity and gaucherie, fostered by the contempt and abuse with which, until middle life, he was treated, gave him a strong inferiority complex that finally turned into the delusion, not uncommon in thwarted natures, that he was persecuted by everybody and betrayed even by his own friends. He felt this not only as a pain but as a wrong because he was convinced of his own rectitude:

I am [he wrote] always the same, more ardent than brilliant in my researches; simple and good, but sensitive and feeble . . . telling my sentiments to all the world, and telling the truth to the public without flattery or bitterness.¹⁸

Note that this claim to excellence is not based on the qualities of the head, reserved by an unjust Nature to the few, but on the qualities of the heart, in which the humblest share. But these qualities were so little appreciated by an unkind world that, at the age of thirty-seven, Rousseau found himself a complete failure. Living a poor life in a dirty Paris hotel, obscure, destitute of social gifts, he understood the poor and oppressed, but disliked the rich and well born, and cherished a deep grudge against the society that had not given him success and happiness.

And then, quite suddenly, he drew from his very poverty and slights a resounding fame. In 1749 the Academy of Dijon offered a prize for the best essay on the question, "Whether the Restoration of the Arts and Sciences has tended to purify literature." When a friend pointed out to him that the writer who would support the paradoxical side of the argument, and prove that the arts and sciences had depraved rather than elevated the human race, would have all the advantages of novelty on his side, Rousseau composed an essay to sustain that thesis, and won the prize. In this paradox was laid the foundation of his whole later doctrine, and in this first essay was discovered not a little of the secret of his later literary method. He told Hume that to strike the public attention the marvelous must be produced, that the marvels of magic and mythology, of fairies and of heroes of romance had outlived their credibility, but that wonder and astonishment might still be evoked in another way, by contradicting the accepted principles of morals and politics, and painting extraordinary situations in life, manners and characters.

That he so exactly saw the machinery of his own method does not prove that his arguments and paradoxes were in-

¹⁸ *Œuvres*, vi, 27.

sincere. Once he had discovered how much might be said against accepted institutions and maxims, he perceived at a glance how well his newly found axioms would explain his own life. He became the passionate, the ardent, the eloquent convert to his new gospel. The golden rule of this gospel and "the fundamental principle of all morality . . . is that man is a being naturally good, loving justice and order."¹⁹ By this he meant to acclaim the untutored impulses and natural wants of the common man as the final criteria of opinions and actions. That man is naturally good, but that society has made him evil by injustice, is exactly what most men in the lower ranks believe on the basis of their own experience. Rousseau therefore became the champion of the return to nature in politics, morals, and education. He became the rationalizer of unreason, the preacher of the superiority of instinct to learned rules, the legislator of individualism and subjectivism. He stands at the head of most of the great revolutions of the late eighteenth and nineteenth century, the revival of religion, political democracy, romanticism, socialism, and the cult of nature.

Besides political and pedagogical tracts he wrote many letters, some poems, articles on music, a novel and an autobiography. His novel, *La Nouvelle Héloïse* (1761), told in the form of letters the story of Julie, a young girl who, like Abelard's Héloïse, fell in love with her tutor, a charming and accomplished young man named Saint-Preux. Notwithstanding the promise implied in his name (which means "holy and brave") he seduced his pupil, who bewailed her lost innocence with frantic self-reproaches and confessions of "the corruption of her soul through vice." When other lovers appeared, scenes of courtship, rivalry, and jealousy ensued, followed by Julie's marriage to a gentleman of good birth and fortune. But the memory of her lost virtue so poisoned her life that she finally expiated her sin by an early death, for which, as a foreseen favor, she piously thanked heaven. The lesson of conjugal and social morality, so

¹⁹ *Œuvres*, vi, 38.

touchingly preached, found enormous favor with the public. No less than seventy-two editions of the novel were called for before the end of the century.

Hardly less popular were the *Confessions*, in which the author aimed to write an entirely frank and honest autobiography.

I undertake an enterprise [said he] which has never had an example and which will have no imitators. I wish to show to my fellows a man in all the truth of nature; and this man will be myself! ²⁰

He achieved a frank self-portrait, interesting as a well-told tale of exciting incident, adorned with charming descriptions of nature, and spiced with eroticism. At times his exhibitionism and persecution mania are disgusting. Less even than other men was he fitted to see and to relate the objective truth. He startled by a new and effective pose. His confession was really a bravado, an arrogant humiliation, an indecent exposure of the soul. Some of the things he recounts of himself are shameful and some are ludicrous and some are both. Such anecdotes of his boyhood as that relating the pleasure he felt in being spanked by his governess, and that telling of a false accusation he brought against a servant, and that describing the way in which he polluted a saucepan, reveal abnormality rather than useful truth. But much that was good in the love of nature, much that was just, and even sublime, in ethics was mixed in with a tale of vulgar vices and ignoble humiliations. The style, far from being the purest French, was both lax, diffuse, and tasteless, and glowing, animated, enthusiastic, and sentimental.

Both Rousseau's virtues and his vices were so congenial to much in the spirit of the age that they produced a powerful effect. Under his tuition sentimentality and love of nature became the rage. "Your writings," said Boswell to him, "have melted my heart, elevated my soul, and kindled

²⁰ *Œuvres*, xiv, 3.

my imagination."²¹ From him dates not only the general love of wild scenery, but the love of domesticity. Even the aristocrats began to find in country life something more than they could get at the capital. Arthur Young wrote in 1787 that the French nobles now lived much at their country seats and that their wives were now ashamed of not suckling their children, because of "the magic of Rousseau's splendid genius." Some people, it is true, took offense at the contrast between Rousseau's preaching domestic virtue and his practice in sending his own children to an orphan asylum. Burke, who studied him deeply and hostilely, contrasted the sentimentality which revelled in benevolence towards the whole species and the callous coldness that cast off his own offspring:

He melts with tenderness for those who only touch him by the remotest relation, and then, without one natural pang, casts away, as a sort of offal and excrement, the spawn of his disgusting amours, and sends his children to the hospital for foundlings.²²

Horace Walpole wrote that no book had ever disgusted him as much as did the *Confessions*; and Dr. Johnson said:

Rousseau is a very bad man. I would sooner sign a sentence for his transportation than for any felon who has gone from the Old Bailey these many years.²³

But if the high-priests of letters and the chiefs execrated him, the common people heard him gladly, and rallied to his standard in such numbers as to be able presently to confound their superiors and to establish their own rule in things spiritual as well as in things material.

3. THE ENLIGHTENMENT OUTSIDE OF FRANCE

It is for the philosophers to be the rulers of the world and the masters of princes. They must think logically and we must act

²¹ *Letters of J. Boswell*, ed. by Tinker, i, 60 (1764).

²² *Letter to a Member of the National Assembly*, 1791; *Works* (Bohn), ii, 535 ff.

²³ Boswell: *Life of Johnson*, ii, 12.

logically. They must discover the right principles and we must put them in practice.

So said, on his accession to the throne of Prussia, the philosopher king, Frederick II. Thirteen days before this event, that is, on May 18, 1740, he wrote Voltaire: ²⁴

I assure you that philosophy appears to me more charming and attractive than the throne; it has the advantage of giving solid pleasure; it removes the illusions and the errors of men.

And he spoke sincerely. In spite of Rousseau's sneer that he talked like a philosopher but acted like a king, he was as remarkable in the one character as in the other. The only other European monarch who in intellectual interest and versatility can challenge comparison with Frederick of Hohenzollern is the medieval emperor whose name bears so curious a resemblance to his, the Hohenstaufen Frederick II. The Prussian had been educated in the strictest military discipline and in the narrowest Lutheran Pietism by his father, a savage and brutal martinet. Taunts, blows, prison, a court martial, and even the threat of a sentence of death, only made the crown prince detest the very name of religion and royal dignity. His interests as a boy were flute-playing and French literature. He became a devoted disciple of Voltaire. He aspired to write great poems and tragedies himself, and did write a vast number of mediocre works in tolerable French. From Voltaire and from Bayle and from Gassendi he learned the principles of free thought, toleration, and hedonism; from Newton and Locke he absorbed science and psychology; and from Pufendorf and Thomasius he acquired a deep knowledge of the more liberal maxims of jurisprudence and administration. When he became king he resolved to put all that he had learned into practice. He issued his program in a tract called the *Anti-Machiavelli*, refuting the immoral maxims of statecraft attributed to the Florentine, and avowing that, "far from being the absolute lord of his people, the king is their

²⁴ *Œuvres de Frédéric*, xxi, 378.

first servant." He promised to work for the education of his subjects, for religious tolerance, and for the advancement of art and science; he hoped to mould his people in freer ideas, milder manners, a broader religion, and a social conception of their duties.

Then came the long series of wars, waged with consummate ability and resolution, and also with a ferocity and perfidy that gave much color to Voltaire's epigram that to refute Machiavelli is just what Machiavelli would have advised his ideal tyrant to do. Though Frederick cynically avowed a desire for fame as his chief motive in provoking these wars, his larger thought was of the aggrandizement of his country, and in this he was, after inflicting terrible sufferings on his people and on all Europe, successful. And in everything but in his militarism he was the most enlightened ruler of the time; his government was the most economical, the most efficient, the most tolerant, and the most progressive then known.

Through all the vicissitudes of a desperate conflict his heart remained true to philosophy and to literature. He wasted nothing on the frivolous amusements loved by most kings but abominated by him. On the field of battle he composed verses with the ease, if not with the elegance, of Rostand's *Cyrano*. At his capital his favorite resort was the Academy of the Sciences. He delighted in the conversation of Voltaire and Maupertuis and La Mettrie and the other luminaries of the age whom he invited to his capital. And he wrote enough to fill twenty volumes of French prose and verse, in addition to a vast German official correspondence. He indited the history of his dynasty and of his own time; he theorized on government, morals, customs, economics, on "The Progress of the Human Spirit in the arts and sciences," and on literature, and on education. He composed plays, epigrams, odes, eulogies, and letters. These latter are his best work; they are full of wit, knowledge of the world, and solid and discriminating judgment. In mordant wit he was second only to Voltaire. Even his decrees were witty; even his diplomatic missives were adorned with jokes that

sometimes cost him dear. In spite of his wit and intelligence he was not always a pleasant companion. He had an abominable taste for practical jokes. His satire was cruel, though his laws were humane. He was always the cynic, free from vanity and sentimentalism and cant, but incapable of generosity or of magnanimity. He was as thin, cold, hard, and sharp as his own sword. But he cut away masses of unreason, superstition, and bigotry; and he made Prussia the most enlightened country in the world.

His only contemporary rival in the education of Germany was a man in almost all respects his antithesis, and one who personally detested him. The literary criticism and the dramatic works of Gotthold Ephraim Lessing (1729-81) have already been described. Though not less rational than Frederick or Voltaire, he was much more conservative. Passionately devoted to the German language and literature, he was the Arminius who freed his nation from the Latin yoke. He rebelled against French models and against the use of the French language, and he wrote the first great modern classics in his own tongue. Though as tolerant as anyone, and as eager to welcome new science and new learning, he was not prepared simply to discard all the religion and most of the institutions of the past. He admired Luther, but wanted a new reformer to carry on and perfect his work. He regarded the religions of the past not as infamous superstitions but as imperfect revelations of progressive truth. In thought, emotion, religion, philosophy, and ethics he was equally distinguished for his progressiveness, his humanity, and his perfect loyalty to truth. His style is like himself, simple, candid, German, and strong. The truth, he wrote in a poem *On Human Happiness*, never deceives us, though we often deceive ourselves, grasping shadows for proofs and finding difficulties in what every child knows. In dramas, in epigrams, in works on Biblical criticism and on religious history, he tirelessly inculcated the lessons of tolerance, of reason, of progress, and of absolute loyalty to truth.

A considerable part in the German Enlightenment was played by the Jewish philosopher Moses Mendelssohn

(1729-86). Preferring the "English philosophy founded on feeling" to "the French philosophy founded on wit," he helped Lessing to save Germany from the destructive animus of Voltaireanism and to give it a positive and constructive program of rational reform. His *Philosophical Discourses*, his *Letters on the Feelings*, though sometimes preachy and sometimes lachrymose, eloquently taught the lessons of tolerance and of the rights of reason.

The German counterpart of Diderot's *Encyclopédie*, though far inferior to it, was the *General German Library* issued in many volumes from 1765-1805 by Christoph Friedrich Nicolai (1733-1811) of Berlin. A publisher, a poet, a critic and a philosopher, somewhat conceited, somewhat garrulous, and not a little the Philistine, he yet worked with sober and effective energy to realize his rather wooden ideas of rationalism.

A typical expression of eighteenth-century thought can be found in the novel *Agathon* by Christoph Martin Wieland (1733-1813). This, the author's first considerable work and the best German novel between Grimmelshausen and Goethe, shows how Agathon, an Athenian youth educated in ancient wisdom, passes through various schools of philosophy until at last he comes to see in the universe "not the work of blind chance or of mechanical forces, but the visible manifestation of the ideas of an infinite intellect," and thus to complete his own education in wisdom and virtue. In the poem *Musarion*, Wieland sings of the "charming philosophy of enlightenment and toleration which enjoys with satisfaction what nature and fate allows and willingly forgoes all else."

To the other countries of Northern Europe the Enlightenment often came, as it did to Prussia, through the despot. Peter the Great of Russia at the beginning of the period, and Catherine II at its end, were both determined to force on their land all the benefits of Western civilization and of Western thought. Czar Peter tried to improve the Russian language by the importation of scientific terms from other tongues, and encouraged the creation of native verse and

drama. After his death Sumarókov (1718-77) successfully polished Russian literary style, purified its vocabulary, and adorned it with careful composition. Catherine II (who reigned 1762-1796) one of the "enlightened despots" equally above moral scruples and vulgar prejudices, passionately admired Voltaire and Diderot and their allies until the French Revolution made her more conservative. In practical reform as well as in speculative thought and literary taste, she introduced much of the best of European civilization to a somewhat reluctant people.

The part taken by Frederick and Catherine in their own lands was taken by Stanislaus Augustus Poniatowski in Poland. Having traveled in the West he made of Warsaw a second Versailles, introduced liberal political reforms, cultivated literature, art, and science, encouraged the press and the theater, collected a large library, built an astronomical observatory, and generally educated his people in the fashionable French thought.

To a sister of Frederick the Great, Queen Louisa Ulrica, Sweden owed the foundation of her first literary Academy in 1753. The secretary of this, Dalin, wrote in a brilliant style, said, by those who know the language, to preserve the purity of the native speech, while giving it the ease and polish of the best French models. While he and his royal patroness for a time made the court the center of literary and scientific interest, a private society, the Order of Thought-builders, by its espousal of the rising fortunes of Voltaire, finally wrested the leadership from it. One of the members of the private society, Hedvig Charlotte Nordenflycht, kept a salon and wrote poetry in the latest French mode.

The government, also, was the chief agent in promoting the Enlightenment in the Austrian Netherlands. Count de Nény, an Austrian official, founded the Library of Burgundy in 1731 and a literary society incorporated in 1772 as the Academy of Brussels. The conflict of the civil power with the papacy led the administration to tolerate French

philosophy, and to license French books disagreeable to the ecclesiastical censors.

Under the oppression of foreign rule and of papal bigotry Italy resisted the Enlightenment until the middle of the eighteenth century. During the first half of the century she produced a rococo art, an Arcadian literature, and a *précieux* style that continued the worse traditions of the seventeenth century. After the Peace of Aix-la-Chapelle (1748) the nation aroused itself to a period of reform in politics and law and to a renewal of literature and thought that has been compared to a second Renaissance. While imbibing a good deal of the form and style of the French encyclopedists Italy produced a prose, a drama, and an opera that gave her prestige in her own chosen fields, comparable to that of the *philosophes* in theirs. Particularly noteworthy as vehicles of popular education were the almanacs so eagerly read by the lower middle classes. Most of them written anonymously and some of them by famous men like Goldoni, they diffused scientific information, corrected morals, satirized superstitions, and attacked abuses effectively.

Almanacs were also important in the popular culture of Spain. The first one extant, written by Diego de Torres Villarroel in 1721, while itself full of humbug, ridiculed superstition. The upper classes found the best means of participating in the current thought of Europe by reading translations, or the originals, of the works of Diderot, Voltaire, Montesquieu, Hobbes, Locke, and Hume. Spaniards who studied in foreign universities brought enough of the new ideas home with them to color the curriculum of Salamanca. The French sympathies of the Bourbon dynasty, the founding of the Royal National Library in 1712 and of the Royal Spanish Academy in 1714, all favored the importation of French thought. One of the first Spaniards to assimilate and to propagate the new thought and to attack superstition and error effectively was the professor of philosophy and theology at the University of Oviedo, Benito Jerónimo Fiejóo y Montenegro (1676-1764). His chief work was a miscellany of science, philosophy, law, economics, lit-

erature, and satire published in eight volumes under the title *Teatro crítico universal* (1726-39).

Though England was the seedplot of most of the ideas that fructified in the Enlightenment, she did not cultivate them with the same assiduity as did the French. This was due largely to the relative mildness of her laws and to the facility with which the new ideas spread of their own impulse. Why rouse, by an unprovoked attack, the sleeping dogs of superstition and tyranny? Why be angry with a church or a state that leaves one in peace and lets one say, in general, what one likes? Tyranny and obscurantism had sharpened the swords of Voltaire and Diderot; liberty and liberalism blunted the weapons of Bolingbroke and Hume.

Even though temperately expressed and generally irenic in tone the new thought produced strange and bitter reactions in the minds of some of those unwilling to accept it and unable to refute it. In every age of transition—and what age, in modern times, is not rapidly changing?—a certain type of mind becomes the battle-field of the new and the old thought, without a victory for either but with great agony and devastation to the thinker. Such a mind was Pascal in the seventeenth and Carlyle in the nineteenth. Such was Jonathan Swift (1667-1745) in the eighteenth. Though disease and frustration in private and in public life sowed the seeds of his rage and despair, these seeds flowered and fruited in an agony of indecisive conflict with the new thought. Mind, heart and brain were consumed in that battle and perished in utter desolation. His first literary success was *The Battle of the Books*. Then came the *Tale of a Tub* to ridicule the squabbling of the churches. No enemy of Christianity could have made more contemptible the very principles which as a dean Swift accepted and defended. His heart was still orthodox; his brain skeptical. In other works, such as his ridicule of astrology in his burlesque almanac, we see his rational side free to express itself; and in still others, such as his argument to prove that the abolition of Christianity would be attended with some inconveniences, we see his conservative side, and the two are always at war.

He could not plead for more sympathy with the poor without clothing his plea in a bitter paradox. His *Modest Proposal for preventing the Children of Poor People from Being a burden to their Parents or to their Country* suggests that babies be fattened for the butcher. The author ends by assuring the reader that his plan is entirely disinterested, as he has no children of his own by whom he could profit.

His woe and fury finally turned to misanthropy, and of that misanthropy was born an allegory, the meaning of which is that men are wicked and imbecile, that their passions are as filthy and cruel as their powers are puny and contemptible. Suggestions for the stories embodied in *Travels into Several Remote Nations of the World*, by *Lemuel Gulliver* (1726) came to Swift from narratives of voyagers and from Irish fairy tales, but the spirit of them is all his own. The insect-like Lilliputians, the gigantic Brobdingnagians, the crazy inhabitants of Laputa, the disgusting yahoos, exhibit the darkest picture of humanity ever painted by a consummate artist. "My purpose," said the author, "is to vex the world rather than to divert it." It is the last irony of fate that he rather diverted than vexed it; that what he intended as the most venomous arrow ever aimed at the heart of mankind should have become a plaything for children; that the volcano of his hate should have been turned down to be a nursery lamp.

Much more hospitable to the newer thought than was the Dublin Dean was his friend Alexander Pope. The two were alike in the capacity for hatred and in the faculty for satire. In each there was a physical foundation for mental bitterness. But they differed in the objects of their hatreds. Swift loved many individuals, but loathed the race of man as a whole. Pope overflowed with benevolence and admiration for mankind in general, but hated most of those whom he personally knew. Swift's misanthropy resembled the agony of a nervous mania; Pope's spite was born of the sense of physical inferiority due to his deformed body. He exulted in the power to hurt the strong and fortunate; and,

like most men who gratify the passion of envy, he rationalized his attacks as services to morality, religion, and sound sense:

Yes, I am proud, I must be proud to see
Men not afraid of God, afraid of me:
Safe from the bar, the pulpit and the throne,
Yet touched and shamed by ridicule alone.²⁵

Naturally his greatest poem was named the *Dunciad*, a mock-heroic epic of stupidity, in which the author's critics, rivals, and other enemies were pilloried and pelted with ridicule. If brilliance of wit, sting of satire, technical virtuosity and command of language could make such a subject sublime, the *Dunciad* would bear comparison with some of the greatest poems of all time. But the animating spirit of the piece is a spite too petty to carry the mighty panoply in which it is dressed.

More to our present purpose is the *Essay on Man*, one of the most sparkling and typical creations of the whole Enlightenment. As Mascarille wrote a *History of Rome* in madrigals, so Pope reduced the current philosophy to a series of epigrams. In four epistles he considered the state and nature of man with respect to the universe, with respect to himself as an individual, with respect to society, and with respect to happiness. A complete system of metaphysics, psychology, political theory, and ethics is crowded into thirteen hundred lines, without an original thought. From Hobbes, Bacon, Newton, Locke, Bolingbroke, and perhaps from a few other authors, Pope distilled the quintessence of his doctrine. Much of it he drew not from specific sources but from the air—from that vital but imperceptible atmosphere of current thought that bathes and sustains the mind of every man as the air bathes and sustains his body.

He begins with God, whom he considers not as the person worshiped by the great religions, but as the First Cause postulated by philosophers and adored by Deism:

²⁵ Pope's *Satires*, *Epilogue*, ii, 207.

Who sees with equal eye, as God of all,
A hero perish or a sparrow fall,
Atoms or systems to destruction hurled,
And now a bubble burst, and now a world.

From the Deity the poet proceeds to the cosmos, which, in Leibnizian vein, he proclaims as the best possible:

Of systems possible it is confessed
That wisdom infinite must form the best. . . .
All are but parts of one stupendous whole,
Whose body Nature is, and God the soul. . . .
All Nature is but art, unknown to thee;
All Chance, Direction, which thou canst not see.
All Discord, Harmony not understood;
All partial Evil, universal Good:
And, spite of pride, in erring Reason's spite,
One truth is clear: Whatever is, is right.

Man's place in the universe is thus described:

Know then thyself, presume not God to scan;
The proper study of Mankind is Man.
Placed on this isthmus of a middle state,
A Being darkly wise and rudely great:
With too much knowledge for the Skeptic side,
With too much weakness for the Stoic's pride.

While the poet's optimism perfectly expressed one phase of the prevalent thought, it was attacked by a more realistic school. Voltaire, who, in his novel *Candide*, ridiculed Leibniz for this same optimism, fell upon Pope for it in his *Philosophical Dictionary*. Quoting, "Whatever is, is right," and "all partial evil is universal good," he comments: "An odd general good, truly, composed of the gout, the stone, pains, afflictions, crimes, sufferings, death, and damnation!"

In 1753 the Prussian Academy proposed as a prize topic:²⁶

An examination of the system of Pope contained in the proposition, "Whatever is, is right." The purpose of the examination

²⁶ Harnack: *Geschichte der Königlichen Preussischen Akademie*, i, 404.

is: 1. To determine the true sense of this proposition according to the suppositions of its author. 2. To compare it with the system of optimism, or choice of the better, in order to mark exactly their relations and differences. 3. To advance the reasons judged most proper either to establish or to demolish Pope's system.

The prize was awarded to a thesis attacking the English poet.

Some of the most highly flavored fruits of the Enlightenment ripened in America, which began, in the eighteenth century, to purvey to the world's emporium of ideas, as well as to the markets for material goods. Prior to 1730 the English colonies had produced no literature except a handful of mediocre verses and two or three notable histories, no music except an occasional tune for hymn or ballad, no original philosophy, theology, or politics, except one fine argument for confessional liberty. If anything, the level of intellectual life declined during the half century following the Revolution of 1689. The first generation had imported a good deal of culture and some learning stored in their own brains. Their immediate descendants were reduced to the poor libraries and inferior universities of a new country. The struggle for a living was hard; the dogmatic religion was oppressive. Until near the end of the seventeenth century there was no printing press in any British American town except Cambridge, Massachusetts, and that press devoted its energies largely, though not wholly, to books of devotion and dogma. In Massachusetts, the most cultured of all the colonies, the growth of liberalism was impeded by its unfortunate connection with the political struggle. It happened that the old theocracy represented both the cause of Puritan conservatism and the aspiration for local autonomy. Reactionary religion therefore came to be allied to patriotic politics; while the more liberal intellectual forces of the time suffered, in popular opinion, by the support they derived from the British government, anxious to break the power of the old Cromwellians in both church and state.

The increase of wealth and population in the eighteenth

century prepared the way for a more general interest in intellectual affairs on the part of larger numbers. A considerable number of books were imported; public libraries were founded; new universities opened their doors, and several scientific and literary societies were formed. Some Americans were elected to the Royal Society of London, and a good many others are found in correspondence with the leading philosophers of Europe. European travelers not infrequently commented on the generally high average of education in the New World and on the eagerness of its inhabitants for intellectual matters. Bishop Berkeley, who spent three years near Newport, Rhode Island, thought the prospects of learning and arts so bright in America that he wrote his famous ode on their dawning glories:

The Muse, disgusted at an age and clime
 Barren of every glorious theme,
 In distant lands now waits a better time,
 Producing subjects worthy fame. . . .

There shall be sung another golden age,
 The rise of empire and of arts,
 The good and great inspiring epic rage,
 The wisest heads and noblest hearts. . . .

Westward the course of empire takes its way;
 The first four Acts already past,
 A fifth shall close the Drama with the day.
 Time's noblest offspring is her last.

Just as Berkeley was writing this prophecy America was producing, in Benjamin Franklin, one of "the wisest heads and noblest hearts" of the century. Indeed, he must be reckoned among the ablest and most versatile men of all ages. As scientist, inventor, business man, philanthropist, statesman, diplomat, and author, he won either respectable, or else very high, rank. His mind lacked that touch of enthusiasm, or tenderness, or self-sacrifice, or poetic illusion that adds charm to the saint and to the singer. But his character was, nevertheless, admirable; he was sane, up-

right, frugal, laborious, judicious, and unbreakably strong in all vicissitudes of fortune. He kept an equal mind in poverty and in affluence. The favor of the great and the adulation of the multitude lavished upon him during a sixteen-year residence in London and a nine-year residence in Paris left him simple and unspoiled. The storms of the Revolution found him immovable and firm. The seductions of Europe made him not a whit less pungently American than he was in his boyhood. Experience of the world made him benevolent and philanthropic instead of cynical and disillusioned. The practicality of a nature that allowed him to accumulate a fortune and that caused him to preach thrift and prudence to others, has of late drawn the satire of a certain school that sees in him the original dollar-chaser and the first American Babbitt. But wealth was not his main object in life. He boasted that he never made a dollar from his scientific inventions. He wrote to a friend:

Your sentiments of the general foible of mankind in the pursuit of wealth to no end . . . are extremely just; at least, they are perfectly agreeable to mine. But London citizens, they say, are ambitious of what they call *dying worth* a great sum. The very notion seems to me absurd.²⁷

Not to make money but to promote the happiness of all was Franklin's ideal in life. At an early age he read Cotton Mather's *Essay to do Good*, which, he says,

gave me such a turn of thinking as to have an influence on my conduct throughout life; for I have always set a greater value on the character of a *doer of good* than on any other kind of a reputation.

It was this that gave his rationalism so practical a shape. It was this that made him one of the great *philosophes*, comparable in his technique and influence with Voltaire. If his art was less finished than Voltaire's, his tact and good humor were superior. His wisdom was simple, genial, and toler-

²⁷ *Works*, iii, 6 (1750).

ant. His ideas were those of his age. As Carl Becker has so well said:²⁸

He was a true child of the Enlightenment. . . . He accepted without question and expressed without effort all the characteristic ideas and prepossessions of the century—its aversion to “superstition” and “enthusiasm” and mystery; its contempt for hocus-pocus and its dislike of dim perspectives; its passion for freedom and its humane sympathies; its preoccupation with the world that is evident to the senses; its profound faith in common sense and in the efficacy of Reason for the solution of human problems and the advancement of human welfare.

These ideas he promulgated in many pamphlets, short articles, books, and letters. His style, modelled upon that of Addison, won the admiration of the greatest of all critics, Sainte-Beuve,²⁹ for its simplicity, delicate and curious analysis, clear, common-sense reasoning, and luminous demonstrations. It was also a plain and popular style—true Quaker American homespun. Its practical efficiency and democratic familiarity showed to equal advantage in his scientific treatises, in state papers, in letters, in an autobiography, and in almanacs.

Poor Richard's Almanack was the most widely read and influential American work prior to the Revolution. It was published annually for a quarter of a century beginning in 1732. Almanacs had long been the most popular form of literature in the colonies, as they were in some parts of Europe. They were the only books, besides the Bible, that everybody bought. The first one known to be printed in America was published at Cambridge in 1639; after which almost every year produced one or more. These books punctuated the calendar with weather predictions, jokes, and apophthegms. It is characteristic of Franklin's mind that he should have seized upon this most widely used but most humble and despised form of literature for the diffusion of his ideas. In 1732 he published the first one under the

²⁸ “Franklin,” *Dictionary of American Biography*.

²⁹ *Causeries du Lundi*, vii, 122.

title: *Poor Richard: An Almanack for the Year of Christ 1733*. By Richard Saunders, Philom., Philadelphia. ("Philom." stood for "philomathetes—lover of learning.") He announced that the booklet would contain, besides astronomical and meteorological information, "pleasant and witty verses, jests and sayings . . . new fashions, games for kisses, &c." He declined to make the astrological predictions still common in such works, because, as he explained in the almanac for 1734:

the stars only show to the skillful what will happen in the natural and universal chain of cause and effects; but 'tis well known that events which would otherwise certainly happen at certain times in the course of nature are sometimes set aside or postponed for wise and good reasons by the immediate particular dispensations of Providence.

The pith of the little octavo pamphlets consisted in shrewd and witty maxims. In the *Poor Richard* for 1757 the author published a whole series of these under the general title of "The Way to Wealth." A little of this advice may serve as a sample of it all:

We complain of the heavy taxes, but we are taxed twice as much by our idleness, three times as much by our folly, and four times as much by our pride.

Sloth absolutely shortens life. . . . Dost thou love life, then do not squander time, for that's the stuff life is made of. . . .

There are no gains without pains.

Leisure is time for doing something useful.

With our industry we must likewise be steady, settled, and careful.

To industry and attention to one's business we must add frugality.

What maintains one vice would bring up ten children.

The artificial wants of mankind are more numerous than the natural.

If you would know the value of money, go and try to borrow some, for who goes a-borrowing goes a-sorrowing.

Such homely maxims were praised by few eminent contemporaries, but they were devoured by the people and soon many of them attained the currency of proverbs. Nor was their popularity confined to the New World. *Poor Richard* was translated into fifteen languages. *La Sagesse du Bon-homme Richard* soon became the rage in France. Of Franklin John Adams wrote from France:

His reputation was more universal than that of Leibniz or Newton, Frederick the Great or Voltaire, and his character beloved and esteemed beyond any or all of them. . . . There was scarcely a peasant or a citizen, a *valet de chambre*, coachman or footman, a lady's chambermaid or scullion in the kitchen who was not familiar with Franklin's name, and who did not consider him as a friend to human kind.

And in England Horace Walpole wrote, in 1774: "A single man sometimes gives a new color to an age. This proved the case in Dr. Franklin."³⁰

³⁰ *Letters*, ed. Toynbee, viii, 449.

CHAPTER XII

EDUCATION

I. UNIVERSITIES

All the creations of a given civilization have, with wide variations in detail, the same style. This style can often be better felt, or suggested, than accurately defined. Everyone familiar with the eighteenth century can see in its institutions, no less than in its intellectual and artistic creations, the products of the same spirit. Under the influence of this spirit, education was remodeled. Rationalism and science began to take the place of authority and literature. An ever expanding public, beginning to assert the cultural democracy that foreran the political democracy of the nineteenth century, extended to ever wider classes the privileges of learning. Secularism and the authority of the state encroached more and more on religion and the power of the church to mould young minds.

This last tendency was felt most strongly in Germany where, under the guidance of the "enlightened despots," universities completely lost their original ecclesiastical character, and became public institutions, founded and administered by the government. The government now appointed professors like other civil officials, supervised instruction, demanded reports on lectures and attendance, and rewarded or reprimanded teachers at the king's or minister's good pleasure. What the government aimed at was not progress in science and learning, but the training of good citizens in the schools, and of able civil servants in the universities. In order to mould the opinions of subjects in the desired shape, most German states forbade their subjects to attend foreign institutions of learning.

The number of university students was then much smaller in Germany than it is now, and the average age less by three years. The form of instruction changed; the disputation died out, and public lectures gave place more and more to private ones. Attendance on the private lectures, open only to matriculated students, was so strictly enforced that Frederick William I of Prussia proposed to consider students who cut lectures as deserters from the army and thus to make them liable to military execution. Even under the strict hand of the despot the professor began to assert his right to free thought, at least in scientific and philosophic matters. The rise in the status of the professor, and his successful fight to introduce new thought and freer research into the old institutions, made an intellectual revolution in Germany hardly less important than the contemporary political revolution in England.

At the beginning of the period the universities stood low in learning, in teaching, and in public esteem. Leibniz neither taught at one nor deemed them worthy of the reform he proposed for so many other institutions. The man who headed the revolt was Christian Thomasius (1655-1728), who taught first at Leipzig and then, after 1687, at Halle. In a series of addresses he attacked pedantry—so aptly called by the Germans “school-foxiness”—hypocrisy, orthodoxy, prejudice, and superstition. In the fall of 1687 he offered a course of lectures in a language hitherto never heard in German academic halls on a subject theretofore never regarded as worthy of a place in the curriculum. He lectured in German on the wise conduct of life, in his first lecture advocating imitation of the polite learning, gallant wit, and good taste of the French. This course of lectures, denounced by his colleagues as an “unexampled horror,” led to his expulsion from Leipzig, but attracted the favorable attention of the Prussian government, which called him to take a chair at Halle.

In education, as in other fields, Prussia showed herself the most progressive of the German states. In 1694 she founded a new university at Halle, turning into lecture

rooms the archiepiscopal palace from which the Catholic prelate had been expropriated when the town fell to Brandenburg in 1680. The two most famous professors in the early years were Thomasius the rationalist and Francke the Pietist. As both Pietism and free thought were anathema to the prevalent Lutheran orthodoxy, the school at which both were influential came to be known, by the punning conservatives, as "the university of Hell." Nevertheless it became for a time the most liberal and distinguished university in Europe and the prototype of all those modern schools in which research and academic freedom have been cherished and fostered. When Christian Wolff became professor of philosophy in 1706 the rational and scientific tendency of the institution was powerfully reënforced. Denouncing all authority in matters of reason, proclaiming the right and duty of free investigation, he transformed the university from a reservoir of canonical tradition into a fountain of original research. At Halle even theology was put under the tuition of the scientific method. Nor did the attention paid to teaching languish. More diligently than elsewhere the best methods of imparting knowledge as well as the best ways of discovering it, were cultivated. In 1768 the Prussian government noted the lack of a coördinating, introductory course, such as is now called in America an "orientation course," and therefore ordered each faculty to offer such lectures on the "scope, limits, connections, plan, sources, and helps of all the sciences treated by that faculty." Still more general was the introductory encyclopedic course introduced at Königsberg, another Prussian university, in 1770, so enlightened that philosophy was there defined as "the ability to think and to investigate the nature of things without prejudices and without sectarianism."

One of the first corollaries to be drawn from the proposition that universities should be dedicated to the search for new truth was the thesis that professors should have academic freedom, that is, the right to set forth the results of their studies without fear or favor. This "liberty of philosophizing," as it was then well called, was demanded by

Gundling in an address made at Halle in 1711. The very purpose of the university, to distinguish the true from the false and the wise from the foolish, would be frustrated, he cogently argued, if any limit were set to research. Both on grounds of right and of expediency he protested against the prescription, by power, of the conclusions to which the search for truth should be bound to lead. Only freedom, he proved, causes science to bloom and minds to put forth their full strength. This doctrine, commonly admitted now, was then fresh and astonishing. In all universities hitherto, and in most for a long time afterwards, novelties had been proscribed and the doctrines on all subjects taught had been prescribed by the ruling powers.

Another forward step in the evolution of the modern university was taken by the foundation of Göttingen by imperial charter in the state of Hanover, in 1734. The modest appropriation of 16,000 thaler (intrinsically \$12,000) per annum made by the government in the first years, was rapidly increased. The model of the new institution was Halle, but its ideas were even more liberal, for the Pietism, strong at Halle, was excluded. Von Münchhausen, the minister of the elector of Hanover best known to us as King George II of England, tried to select as professors men whose "doctrines lead neither to atheism nor to naturalism, and who neither attack the fundamental articles of the evangelical religion, nor countenance the enthusiasm of a Protestant papacy." In other words he tried to exclude the extremes of irreligious radicalism and of confessional conservatism. Once a professor had been appointed he was usually allowed complete freedom in teaching. The emphasis in the curriculum was placed upon the natural and social sciences, though the classics were successfully taught by J. M. Gesner, who interested his students in the aim, spirit and art of the Greek and Roman writers. The lectures were all in German. Another excellent feature of the university was the accumulation of a fine library and its opening to students and to scholars generally. "The position of librarian," said Münchhausen, "is the most

important of all, and the most humane of all." The library, which housed 200,000 volumes by 1763, was now made the chief instrument of study. No longer were the students expected and obliged to confine themselves to lecture notes and a few text-books; rather they were expected to look up for themselves the best treatises on the subjects of their studies.

The other German universities followed the lead of Halle and Göttingen somewhat slowly. Leipzig, after expelling Thomasius, reformed itself along the lines he would have wished. The faculties of law modernized themselves to the extent of adopting Pufendorf; the schools of medicine replaced the study of the ancients by the study of the microscope and dissecting knife. Everywhere the professors were so poorly paid that they were obliged to eke out a living by taking boarders, by private tutoring, and by the practice of law, medicine, or divinity. Their schedules were heavy; the average professor was expected to lecture twenty or even twenty-four hours a week—twice as much as the German professor now does and three times as much as the American professor.

During the eighteenth century the faculty of arts became the largest and most highly esteemed department of the university. No longer regarded as merely a preparatory training school for the higher faculties, it was valued by the public as the best means of attaining a liberal education in literature and science. The number of students in the faculty of arts was swelled by many boys of the leisure classes who had no intention of pursuing a professional career or even of taking a degree. Among the 15,000 students who matriculated at Göttingen during its first thirty years there were eleven princes and 148 counts. The boys of the lower and middle classes aped the dress and manners of their noble comrades, discarded the academic gown except on festal occasions, wore spurs, a cloak and a sword, fought duels, and boasted of amours.

Many of the students found happiness in a life of intellectual stimulus, comradeship, and pleasure. Goethe in one

place says that his student days at Leipzig were the happiest of his life. Elsewhere, however, he criticized the instruction that he there received somewhat sharply. He learned nothing, he says, from the lectures on philosophy, which taught him only the processes of logic that he had used unconsciously since childhood, and nothing from the lectures on law which he had not already learned from his father. With a passion for language and literature, he was not in sympathy with the newer subjects offered. The method of teaching he found bad, in that the young professors learned their subjects at the expense of the students, and the old professors, stationary since their own school days, taught the obsolete and false. Or, as the student in *Faust* puts it: "The professors handed me lies from old books, which they did not believe themselves; and so they robbed me and themselves of true life."¹ These are just the charges made by the brilliant man of every age against the education in spite of which he has attained success.

While reforming the universities the eighteenth century began in some countries to provide for the needs of the newer professions, such as engineering, by the foundation of technical schools. The first of these in Germany was the school of mines known as the Collegium Carolinum started at Brunswick in 1745. Similar schools were opened at Freiberg in 1765 and at Clausthal in 1775.

Outside of Germany European universities made little progress during the period of the Enlightenment. They were held in bondage by church and state, were anchored firmly to the Middle Ages in their ideals, and were commonly despised by the progressives as obsolete, monkish foundations, busy with crotchets and enslaved to the antique. What little progress is discernible usually took place in the small countries, or in those of recent civilization. In Russia the foundation of the University of St. Petersburg in 1747, and of one at Moscow in 1755, marked an advance. In Denmark a comprehensive reform of the University of Copenhagen was demanded by the liberal min-

¹ *Aus Meinem Leben*, Book VI; *Faust*, Part II, lines 6705 ff.

ister Struensee, and carried through by Bishop Gunnerus. The school was divided into two faculties, that of theology and that of arts; in the latter a generous curriculum of languages, philosophy, science, history, law, finance, and medicine was offered; and all lectures were given in the vernacular.

While Leyden maintained the moderately progressive traditions of her first youth, her great rival Louvain sank to exhaustion in a struggle with the Jesuits that proved almost equally fatal to both combatants. For the university the battle ended in 1730 with complete subjection to the pope and with the nearly complete extinction of science. While Newton and Leibniz were avoided, physics and philosophy were taught from scholastic text-books, and religion from the catechism of the Council of Trent. The professors, as men of narrow views, archaic methods, vulgar manners, and timid minds, extinguished in their pupils all generous curiosity and all intellectual ambition.

Nor was the condition of the French universities much better. The University of Paris, once the mightiest and most renowned of all institutions of learning, struggled helplessly against the oppression of king and priest. Charles Rollin, who became Rector in 1694, put forth vigorous, but ineffective, efforts to remedy the "almost complete dissolution of learning" which he found in all the colleges. Still shaken by religious controversies and still persecuted by the civil and ecclesiastical authorities, the professors were obliged, in 1704, to sign a promise "to teach nothing contrary to the faith or to the decrees of the councils" and "in treating physics not to say anything that would make them suspect, or to mention any theological matter." During the last year of Louis XIV many professors were exiled for refusing to accept the papal bull *Unigenitus* (1713) condemning the theses of Quesnel on the doctrine of grace. The exiles, however, were recalled soon after the accession of Louis XV, when the government found it to its interest to foster the Jansenist party. When this party won control of the university it made itself as odious to the liberals by

its narrow and persecuting policy as ever its enemies the Jesuits had been. A satire by De Lille enjoyed much popularity. It represents Truth seeking admission to the Sorbonne, and being turned away by the presiding official, with the words, "Flee, or I shall accuse you of impiety." Truth then replies: "You chase me out; but I shall have my turn. I am the daughter of Time, and I obtain all things from my father."

The Italian universities did not change much in the eighteenth century. By bequest and gift they gradually increased their physical equipment in laboratories, instruments, and books. A few professors enjoyed high reputations and good pay. The majority were so wretchedly provided for that they were obliged, as one of their victims put it, "to take it out on the students."² The boys divided their attention between class work and such dissipations as fighting, gaming, and drabbing. The reform of studies imposed on Pavia by the Empress in 1773 shows how conservative were the prevalent educational ideals. All candidates for a degree were obliged to take an oath not to say, do, or write anything in public or in private against the Catholic religion, good morals, or the imperial government. The teaching of the professors and the text-books used by them were supervised by the head of the university. They were encouraged by rewards to publish useful books. Provision was made for the library, the museum of natural history, the botanical garden, the anatomical theater, chemical supplies, and machines.³ The curriculum included logic, metaphysics, moral philosophy, the history of Italy, Greek and Roman eloquence, algebra, geometry, physics, and natural history.

Even more decadent than were the Italian and French institutions of the higher learning were those of Spain. The professorships were sinecures. The progressive Villarroel complained justly that no school or college dared to teach the elements of science. By the middle of the eighteenth century Alcalá had a library of 17,000 volumes, of which

² Casanova, *Mémoires*, viii, 303.

³ *Statuti e ordinamenti dell' Università di Pavia*, 1925, 202 ff., 224 ff.

only 500 dealt with modern science or philosophy. In 1769 Charles III appointed a director for each university and in 1770 a censor for each, to see that orthodox religion and absolutist politics were taught. In 1771 he tried to introduce a few new courses in science; this praiseworthy attempt elicited the protest of the faculty of Salamanca, who reported that "Newton's teaching does not produce good logicians or metaphysicians; and Gassendi and Descartes agree less closely with Holy Writ than does Aristotle."

More zeal for learning was displayed by the Spaniards of the New World than by those of the Old. The University of Mexico continued, throughout the eighteenth century, to be the largest institution of learning in America, graduating an average of 135 bachelors and four or five doctors each year. The University of Caracas, in Venezuela, was founded in 1721. In 1713 the Town Council of Santiago in Chile petitioned for a university in order to train lawyers and physicians. The royal decree, granting this request by founding the University of San Felipe, was promulgated in 1738, but instruction did not begin until 1756. All Spanish American universities were modeled on Salamanca. Lectures continued to be given in Latin. Almost all the professors were clergymen, and the majority of these were Jesuits. In addition to the subjects usually taught at European colleges, Indian languages were given some attention.

Throughout the period of the Enlightenment the two great English universities, though adorned by a few great names, remained somewhat old-fashioned in learning as they were in politics and religion. A Newton at Cambridge and a Bentley at Oxford shine even more brightly than they would otherwise in contrast with the prevailing mediocrity of the professoriate. Both universities continued to exclude all but Anglicans; Oxford continued to be Tory, and even Jacobite, in politics. Both institutions had felt the tyranny of James II. This monarch came into violent conflict with Oxford when he tried, in 1687, to force the Fellows of Magdalen College to elect Bishop Parker as their president, and when, on their refusal, he declared Parker elected any-

way. For their continued refusal to recognize this appointment, the Fellows and Demies (undergraduate scholars) were expelled. Thereupon the king appointed Bonaventure Giffard, a Catholic, president, and turned Magdalen into a Roman Catholic seminary. With Cambridge, too, James came into conflict over a religious matter. At a time when degrees were granted only to subscribers to the Thirty-nine Articles, James tried to force Cambridge to give an M.A. to Father Francis, a Benedictine monk; this he intended as an entering wedge to open the university to members of his communion. When the university stood upon its rights it was bullied by a commission headed by Judge Jeffreys.

While this treatment made of Newton and some other Cambridge professors Whigs in the Revolution of 1688-89, it failed to shake the loyalty of Oxford to the lost Jacobite cause. At the accession of George I demonstrations in favor of the Pretender forced the government to send troops to Oxford. At the same time Cambridge was rewarded for its acceptance of the Hanoverian dynasty by a gift of books. The wits of the two universities exchanged epigrams to celebrate this difference in their treatment. Professor Trapp, of Oxford, wrote:

King George, observing with judicious eyes
The state of both his universities,
To Oxford sent a troop of horse; and why?
That learned body wanted loyalty.
To Cambridge books he sent, as well discerning
How much that loyal body wanted learning.

But a Cambridge wit replied:

The king to Oxford sent a troop of horse,
For Tories own no argument but force.
With equal skill to Cambridge books he sent,
For Whigs admit no force but argument.

An intelligent effort to reconcile the universities to the Hanoverian dynasty, and at the same time to train men for public service, was made by George I when he founded, in

1724, the first chairs of modern history and modern languages at both institutions. The chair at Cambridge was adorned by the incumbency of the poet Gray during the years 1769-71. While Cambridge took the lead in science, Oxford maintained her primacy in languages and law. Bentley in the classics, William Jones in oriental tongues, and Blackstone in law, gave to Oxford the lustre of the greatest names in their respective fields. The favorite studies, and the most highly rewarded, were the classics, logic, and philosophy. As the professors declined the labors of teaching, the tutorial system developed, by which the instruction of the youths and the guardianship of their morals and manners was placed in the hands of young masters resident in the various colleges. As a matter of fact very little was required of the student, and nothing at all of the professor. Lord Chesterfield recommended his natural son to be a professor of Greek at one of the universities, as "being a very pretty sinecure and requiring very little knowledge of that language." Adam Smith, who studied on the *Isis* in 1740, said:

In the University of Oxford the greater part of the public professors have for many years given up altogether the practice of teaching. . . . The youth are neither taught, nor always can find any proper means of being taught, the sciences which it is the business of those incorporated bodies to teach.

The qualifications for the Fellows of All Souls College, Oxford, was that they should be *optime nati, bene vestiti, mediocriter docti*—of gentle birth, well dressed, moderately learned. Degrees were given very easily, especially to nobles. One candidate passed a Latin examination by giving the pedigree of a race horse. Lord Eldon gave the following account of his examination in 1770:

I was examined in Hebrew and in History. "What is the Hebrew for the place of a skull?"—I replied, "Golgotha."—"Who founded University College?"—I stated (though, by the way, the point is sometimes doubted), that "King Alfred founded it."—

"Very well, sir," said the Examiner, "you are competent for your degree."

While such a system of instruction and examination pleased the average student, it bitterly disappointed the more intellectual aspirant for learning. Horace Walpole, who loved literature, found his appetite for it starved at Cambridge in 1736. While a student at King's College he wrote a friend: ⁴

I have been so used to the delicate food of Parnassus, that I can never condescend to apply to the grosser studies of Alma Mater. Sober cloth of syllogism color suits me ill . . . 'tis thrashing to study philosophy in the abstruse authors. I am not against cultivating these studies, as they are certainly useful; but then they quite neglect all polite literature, all knowledge of this world.

A much harsher judgment of Oxford was passed by the historian Gibbon, who entered Magdalen in 1752 as a Gentleman Commoner "with a stock of erudition that might have puzzled a doctor and a degree of ignorance of which a schoolboy would be ashamed." Late in life he wrote:

To the University of Oxford *I* acknowledge no obligation. . . . I spent fourteen months at Magdalen College; and they proved the most idle and unprofitable of my whole life. . . . The schools of Oxford and Cambridge were founded in a dark age of false and barbarous science, and they are still tainted with the vices of their origin. Their primitive discipline was adapted to the education of priests and monks; and this government still remains in the hands of the clergy—an order of men whose manners are remote from the present world and whose eyes are dazzled by the light of philosophy.

The spirit of the university, he added, is "narrow, lazy, and oppressive," while the professors are "decent easy men, who have absolved their consciences from the toil of reading or thinking or writing."

Still more severe was the verdict of Jeremy Bentham, who

⁴ *Letters of Horace Walpole*, ed. by Toynbee, i, 20.

matriculated at Oxford in 1760. Disappointed in his studies and finding his scruples about the Thirty-nine Articles treated with casuistry or ridicule, he declared: "In mendacity and insincerity I found the effects—the sure and only sure effects—of an English university education."

These judgments all came from the choice and master spirits of the time, such as have always expected the most from their educators, and have been correspondingly disappointed at finding the standards not geared to the speed of genius. The large majority of students went to college for a good time, and got it, at least if they were rich and well born. When Alciphron, the thoughtful freethinker of Berkeley's *Minute Philosopher*, complains that the universities are "now only nurseries of prejudice, corruption, barbarism, and pedantry," Lysicles, the dissolute young freethinker, adds:

I find no fault with the universities. All I know is that I had the spending of £300 a year at one of them, and think it the cheerfullest time of my life. As for their books and style, I had no leisure to mind them.

In like manner, when Peregrine Pickle, the hero of Smollett's novel, went to Oxford, he frequented taverns and coffee-houses, indulged in midnight frolics in the streets, insulted all the sober and pacific students, kept his own horses, attended races, and visited the wenches in nearby villages for the sake of carnal pleasures. He did not, however, neglect to cultivate his taste in music and painting, nor even entirely fail to pick up a little classical learning and natural philosophy.

If America, during the period of the Enlightenment, could boast no names as great as some that adorned the faculties of Oxford and Cambridge, Halle and Königsberg, she evinced that enormous zeal for learning that has distinguished her in every age. In no country in the world has a larger proportion of the population sought and found the opportunity for the highest and broadest education obtainable. In no country, not even in Germany, has the proportion of devoted teachers and serious students been larger.

In the eighteenth century, at any rate, the youth who sought the universities were extremely serious. Many of them intended to become ministers, and the rest also wished to make the most of their opportunities. The idle rich, who now infest our academic halls, were then but a negligible proportion of the student body. The course of studies, modeled on that of the English seats of learning, emphasized the classics and theology. Lectures were given in Latin; and students were required to speak it. The curriculum included Latin, Greek, logic, rhetoric, arithmetic, geometry, ethics, politics, physics, astronomy, and sometimes Hebrew. Little attention was paid to history, geography, or economics. As the period approached its end more emphasis was placed on English composition and eloquence, and more on science. John Winthrop, next to Franklin the most eminent American scientist, and an original observer of earthquakes, comets, and meteorology, taught at Harvard for forty years (1738-78).

At this time America began to multiply her universities. The desire of every considerable church, and the wish of every colony, or of every region, to have its own seat of learning led here, as it did in Germany, to the planting of an enormous number of colleges. For more than half a century after her founding Harvard in Massachusetts was the only American university. Before the Revolution six other colleges or universities had been founded: William and Mary in Virginia (1693); Yale in Connecticut (1700); New Jersey, later known as Princeton (1746); King's, later known as Columbia, in New York (1754); Pennsylvania (1754); Rhode Island, later called Brown (1764). To these might be added Dartmouth in New Hampshire (1769), though it was then only an Indian mission school.⁵

During the period of the Enlightenment, as in almost all other ages of American history, Harvard took first place among the national universities. Cotton Mather wrote its history in his *Magnalia Christi* in 1702, boasting:

⁵ Rutgers (Queen's College) in New Jersey, though given a charter in 1766, did not really open its doors until after the Revolution.

Behold an American University . . . which hath been to these plantations, as Livy saith of Greece, for the good literature there cultivated, the salt of the peoples; an University which may make her boast unto the circumjacent regions, like that of the orator on the behalf of the English Cambridge: "We have brought it about that dullards should not lead the people, that the churches should not lack theologians, the courts of justice lawyers, and the towns physicians; we have filled the state, the church, the private house, and the army with learned men. . . ." Finally, an University which hath been . . . a river, without the streams whereof these regions would have been mere unwatered places for the devil!

Eighteen years later Mather changed his opinion about the merits of the institution, and told the professors that they were teaching "foolosophy," their metaphysics being "the excrement of all studies" and their ethics a form of impiety. What had happened to bring about this change was that Harvard broke away from the domination of the Mathers, and turned toward the liberal party in the church. Increase Mather, who had been, under various titles, head of the college since 1685, was forced to resign in 1701, and in his place more broad-minded men were elected. The foundation (1721) by Thomas Hollis of a professorship of divinity which might be held by Baptists, or men of other than Congregational creed, made Harvard more liberal in its religious teachings than were the other British or American universities. Indeed, the spirit of the place became so advanced as to arouse the wrath of the Methodist evangelist Whitefield when he visited New England in 1740. The impiety of Harvard, he complained, reminded him of that of Oxford; the professors neglected to pray with their students and to examine their hearts, and even allowed them to read latitudinarian books, such as those of Tillotson and Clarke, instead of confining them to the strictly orthodox. President Holyoke of Harvard replied to this charge in a spirited sermon and in a pamphlet accusing Whitefield of hypocrisy, slander, and falsehood.

The college, though still very small, continued to grow in numbers and in wealth. After 1719 no class fell below

twenty; and in 1725 the number of graduates rose to forty-five. The library contained all the fathers and classics in Greek and Latin, the *Transactions of the Royal Society*, the publications of the *Académie des Sciences*, and other scientific books, and the best English poetry and history. The philosophical apparatus included some machines for experiments in physics, an orrery, some microscopes and some telescopes, one of them twenty-four feet long.

Next to Harvard the oldest college in America is William and Mary, founded by royal charter at Williamsburg, Virginia, in 1693. The charter declares the purpose of the institution to be "to provide a seminary of ministers of the Gospel, to educate the youth piously in good letters and in manners, and to propagate the Christian faith among the Western Indians." An appropriation was made by the government from the colonial revenues, and money was raised by wealthy planters. A building to house the library and philosophical apparatus was erected on plans drawn by Christopher Wren; but was destroyed by fire in 1705. For a time the institution suffered from poverty, being described in 1724 as "a college without a chapel, without a scholarship, without a statute; there is a library without books, comparatively speaking, and a president without a fixed salary till of late." Within fifty years after this the college grew in wealth, numbers, and distinction. Its graduates, drawn from the Southern aristocracy, played a remarkable part in the Revolution.

As the University of Leipzig owes its foundation to the Hussite schism at the University of Prague, so Yale owes its existence to the schism between the liberals and conservatives at Harvard. It was founded as a "collegiate school" in 1700 at Saybrook, Connecticut, by men intent on preserving a purity of doctrine no longer found at Cambridge, Massachusetts. After migrating several times it finally settled in New Haven, in 1717, and took its name after Elihu Yale, who had been born in Boston in 1649 and had made a fortune in the service of the East India Company in England. His benefactions, though not enormous, were sufficient to

start the infant institution in life. Other benefactors, among them Jeremiah Dummer and Bishop Berkeley, sent large numbers of books. In the first years, at least, the students were carefully shielded from the menace of modern thought. Samuel Johnson, of Connecticut, later president of King's College, says that in his student days at Yale, he had heard of

a new philosophy that of late was all in vogue and of such names as Des Cartes, Boyle, Locke, and Newton but they [the students] were cautioned against thinking anything of them, because the new philosophy, it was said, would soon bring in a new divinity and corrupt the pure religion of the country; and they were not allowed to vary an ace in their thought from Dr. Ames's *Medulla Theologiæ* and *Cases of Conscience* and Wollebius, which were the only systems of divinity that were thumbed in those days and considered with equal if not greater veneration than the Bible itself.

Fortunately, even Connecticut orthodoxy could not long resist the spirit of progress. A poem addressed to Yale about 1733 declared:

Here nervous Locke the sure foundation lays
Of sterling reason and His lasting praise;
By Dummer nursed as by a patron's care
Here science grows, and grows divinely fair. . . .
With well-distinguished wreaths do Newton shine
And Berkeley, both immortal, both divine.

In religious matters, however, Yale continued to take the conservative side, and to enforce opinion by coercive measures. In 1743 President Clap imprisoned one student and expelled some others for attending separatist meetings. As a rebuke to him some members of the senior class reprinted Locke's *Letter on Toleration*. Reprimanded by the president and board of governors, all the students concerned retracted except one, who threatened to appeal to the king in council. This threat proved so effective with the bullies that they treated the rebel with much complaisance and granted him his degree. The conservatives accepted defeat

with a bad grace. Whitefield complained of Yale, as he had of Harvard, that its "light was become darkness, darkness which may be felt"; and Jonathan Edwards accused the students of stealing chickens and pigs, taking unlawful walks at night, breaking windows, and using profane language.

With all deference to such eminent authorities as those just quoted it may be said that formalism and pedantry constituted greater dangers to the young minds shaped at Yale than did impiety and immorality. John Trumbull, one of the most brilliant of American wits and poets of the eighteenth century, published, in his student days, a satire on his *alma mater* entitled *The Progress of Dulness*. In it he represents Tom Brainless as "dozing away four years in college in sleep and slothfulness and play," murdering the classics, and yet losing his own tongue in order to master the ancient ones.

The College of New Jersey, later known as Princeton, owed its origin to the desire of the Presbyterians to have a school of their own denomination. In 1746 Governor Belcher of New Jersey granted a charter to the petitioning ministers allowing them to found "a seminary of religion and learning for the better enlightening of the minds and polishing the manners of this and neighboring colonies." In 1757 Jonathan Edwards was elected president, but died within a few months afterwards.

Not to be behind the other colonies New York secured a royal charter for a university, first known as King's College, and after the Revolution as Columbia. Acrimonious disputes between the Anglican and Dutch Reformed churches as to the governance of the college delayed the signing of the charter until 1754. The law then gave the Anglicans the predominant and the Dutch Reformed a minority representation on the board of trustees, provided that the president should always be an Anglican, and allowed liberty of conscience to students and professors. The college was fortunate in securing as its first president Samuel Johnson of Connecticut, a man almost as learned as, and considerably more broad-minded than, his English namesake. Educated

in the strict Puritan Congregationalism of Yale, he expanded his mind and changed his religion after a visit to England, where he took orders in the Anglican church. His program for the new institution over which he was called upon to preside was set forth by himself in an inaugural address as follows:

The college aims to instruct and perfect in the learned languages; in writing correctly and speaking eloquently; in the arts of numbering and measuring; in surveying and navigation; in geography and history; in husbandry, commerce, and government; in knowledge of all nature . . . ; in everything useful for the comfort, the convenience, and the elegance of life, in the chief manufactures; to lead them [the pupils] from the study of nature to the knowledge of themselves and of the God of nature, and their duty to him, themselves, and one another; and everything that can contribute to their true happiness, both here and hereafter.

Of all American institutions of learning in colonial days the most progressive and original was the Philadelphia Academy that later developed into the University of Pennsylvania. Whereas all the other early colleges had laid the emphasis on sectarian religion and on the classics, this institution started to give a secular and practical education. Its plan of studies was drawn up by Franklin in 1749, and its doors were opened in 1755 with an endowment of £5,000 raised by him. Instruction was provided in mechanics, physics, chemistry, mathematics, surveying, accounting, history, agriculture, and languages, with especial emphasis on the mother tongue. As one of the first great technical schools in the world it aimed to train merchants and lay citizens rather than aristocrats and clergymen. The purpose of the institution was to

contribute to the cultivation and improvement of the country and to the wisdom, riches, strength, virtue, piety, welfare and happiness of the people by educating the youth, forming their manners, imbuing their tender minds with the principles of rectitude and

morality, and instructing them in . . . all useful branches of all liberal arts and sciences.

The College of Rhode Island (later to be known as Brown University) owes its origin to the desire of the Philadelphia Baptist Association to provide for an educated ministry. As Baptists still lacked full liberty in most colonies, the members of that church naturally turned to Rhode Island, the freest state in the world. From the legislature of the province they secured a charter excluding all religious tests and all sectarian teaching in the arts college, and giving all Protestants equal rights to be chosen as professors. The college was opened at Warren in 1764 and removed to Providence, where it still stands, in 1770.

An equal degree of religious liberty to faculty and students was provided in the royal charter for Dartmouth College in New Hampshire. This is the more remarkable as the school was originally intended to "introduce religion, learning, agriculture, and manufactures to the pagans in America." The charter of 1770, granted soon after the school had been actually opened, allowed it to admit English youth in order to fit them for being missionaries among the Indians.

2. SCHOOLS

Children must certainly be counted among the oppressed classes of the world. At all times and in all countries parental love has lavished affection and care on some children. But, in spite of this, cruelty, spite, ignorance, greed, and other evil passions, as well as custom and a perverted sense of parental duty, have made the lives of many children at most places and in most ages, unhappy. During the eighteenth century children suffered from the formality and exaggerated pietism of their elders. Their normal activities were suppressed. Every hour was dedicated to some serious duty. They were treated and dressed as miniature adults; their bodies encased in stiff, modish clothes, and their minds similarly bound in codes of courtly manners.

They were expected to be models of piety as well as of correct behavior. Cotton Mather published in 1700 *A Token for the children of New England*, consisting of moral examples and anecdotes of babies, compared to whose precocious priggishness all later Sunday-school stories appear wild and natural. Consider, for instance, the godly Elizabeth Butcher, of Boston, who died in her ninth year:

When she was about two and a half years old, as she lay in her cradle, she would ask herself that question: "What is my corrupt nature?" and would make answer herself to herself, "It is empty of grace, bent unto sin, and that continually." She took great delight in learning her catechism, and would not willingly go to bed without saying some part of it. . . . But nothing more extraordinary, as we remember, appeared in her, till she came to be about six years old. Then she began to inquire concerning God and the nature and affairs of her soul, and she said, she was afraid she had not lived up to that end for which she was made. . . . One morning as she lay in her bed she said: "O that charming day, O that sweet day is coming." Being asked what day she meant, she answered, "Catechizing day."

The unnaturally serious view of life forced on children at a tender age excluded all place for play. The German Pietists in their schools endeavored to make the pupil apply himself to study and devotion the whole time:

showing the children, in an evangelical way, the vanity and folly of play, and how their minds are thereby led away from God, the only good, and distracted to the perdition of their souls, and showing them, at the same time, wherein they can find true pleasure and joy, namely, in the Lord Jesus and in his love, friendliness, and sweetness.

John Wesley, who perhaps owed something to the Pietists, drew up rules for a school in which the children were roused at four o'clock in the morning to spend an hour in private devotions. Quoth the Methodist evangelist:

As we have no play days, so neither do we allow any time for play on any day; for he that plays as a child will play as a man.

Until the latter part of the seventeenth century no books, except lesson books, were written specially for children; and very little was written about them. Except for lullabies and nursery rhymes, the first notable children's book was the *Mother Goose* (*Contes de ma Mère Oye*) published by Charles Perrault in 1697. These vivid tales, sometimes gruesome, but generally charming and fanciful, with kind little fairies, were popular in France and were much imitated, translated, and adapted in other countries also.

Moralistic books for children had a greater vogue, especially in England and America, than did fairy tales. Bunyan's *Book for Boys and Girls* (1686) teaches ethical lessons in rhyme by comparing vicious persons to unpleasant animals—the hypocrite to the frog, and the glutton to the swine, for example.

A better and more popular specimen of the same genre is Isaac Watts's *Divine and Moral Songs for Children* (1720). His rhymes, "Let Dogs delight to Bark and Bite," and "How doth the Little Busy Bee," and others, are known to our generation only in Lewis Carroll's parodies; but after all, the reverend author allowed a small place to recreation. If he taught that "Satan finds some mischief still for idle hands to do," he also contemplated the child playing:

In books, or work, or healthful play
Let my first years be passed,
That I may give for every day
Some good account at last.

The chief instrument for enforcing discipline continued to be the rod. If it was not much spared at home, it was worn to shreds at school. In the middle of the eighteenth century a philanthropist of Württemberg tells of a schoolmaster who, after fifty-one years of teaching, reckoned that he had given 911,527 strokes with the stick, 124,000 lashes with the whip, 136,715 slaps with the hand, and 1,115,800 boxes on the ear, not counting other methods of applying force. This cruelty was approved by most pedagogues. Dr. Johnson

said that he learned Latin only because he had been well whipped, and he added:

There is now less flogging than formerly in our great schools, but then less is learned there; so that what the boys get at one end they lose at the other.⁶

On the other hand humane writers protested against such doctrine; an essay in the *Spectator*,⁷ signed "T," declared the author's conviction

that no boy who will not be allured to letters without blows will ever be brought to anything with them. A great and good mind must necessarily be the worse for such indignities.

A main reason for the prominence of the rod in the equipment of the schoolmaster was that it was the instrument that he was best able to wield. The average pedagogue was ignorant, uncultured, and stupid. John Trumbull painted the American teacher as the Tom Brainless, who, having graduated from Yale with nothing to show for it but a little Latin, himself becomes a schoolmaster

And tries with ease and unconcern
To teach what ne'er himself could learn. . . .
Thinks flogging cures all mortal ills,
And breaks their heads to break their wills.

An even more unattractive picture of the pedagogue is drawn by Richard Steele in these words in the *Spectator*:

I must confess I have very often, with much sorrow, bewailed the misfortune of the children of Great Britain, when I consider the ignorance and undiscerning of the generality of schoolmasters. The boasted liberty we talk of is but a mean reward for the long servitude, the many heartaches and terrors, to which our childhood is exposed in going through a grammar-school. Many of these tyrants exercise their cruelty without any manner of distinction of the capacities of children, or the intention of parents in their behalf.

⁶ Boswell: *Johnson*, ii, 46 and 407.

⁷ No. 157, August 30, 1711.

Seen in a satirical light the schoolmaster meets us in Pope's *Dunciad*:

When lo! a spectre rose, whose index hand
Held forth the virtue of the dreadful wand. . . .
Eton and Winton shake through all their sons.
All flesh is humbled: Westminster's bold race
Shrink, and confess the genius of the place. . . .
Then thus: "Since man from beast by words is known,
Words are man's province; words we teach alone. . . .
Placed at the door of learning, youth to guide,
We never suffer it to stand too wide. . . .
We ply the memory, we load the brain,
Bind rebel wit and double chain on chain . . .
Whate'er the talents, or howe'er designed,
We hang one jingling padlock on the mind."

Doubtless there were some good and kind men in the profession, like the schoolmaster of Goldsmith's Auburn, whose only sin was the foible of omniscience, and who so astonished the villagers with his learning that

Still they gazed and still the wonder grew
That one small head could carry all he knew.

In general, the abilities and virtues of the profession were small because it was too poorly paid and too ill esteemed to attract a good quality of young men. In one of his works Goldsmith⁸ drew a very dark picture of the hard life of a school-master, summing it up in the advice: "If you are for a genteel, easy profession, bind yourself seven years apprentice to turn a cutler's wheel, but avoid a school by any means." Of course the social position and the pay of teachers varied according to the school and their rank in it. Masters at the best schools, such as the Berlin Royal School and the great English public schools, ranked well in social opinion, and were fairly well paid. The average pay for a master in a Prussian Latin school was 600 thalers per annum in addition to board and lodging. Allowing that money had a purchasing power four or five times as great then as it

⁸ *Vicar of Wakefield*, chap. xx.

has now, this would be equal to \$2,000 per annum in addition to board and lodging at present. This is not a munificent salary; but neither is it a beggarly one.

The sons of the European aristocracies were often educated by tutors. These tutors, outside of France, were often Huguenot exiles. The culmination of the course would be the grand tour, by which the young man would be supposed to familiarize himself with the languages, laws, institutions, art, manners, and civilization of foreign countries. The most cultured states of Europe were naturally those generally visited; but Sir Charles Grandison, whom Richardson represents as having surpassed the standards of his contemporaries in other respects, surpassed them also in this, that, as a youth, his grand tour had included some parts of Asia and Africa. How much the boy really profited by his opportunities depended on himself and on his social position. Grandison, of course, took in everything; Philip Stanhope, with introductions and advice from his father, the Earl of Chesterfield, acquired a high degree of social polish; Peregrine Pickle, on the other hand, when taken to France by his "governor," learned only of the inns, cab fares, and tailors and how

to scold the servants in tolerable French. But the laws, customs, and genius of the people, the characters of individuals, and scenes of polished life, were subjects which he had neither opportunity to observe, inclination to consider, nor discernment to distinguish.

Next to the services of a private tutor the public schools were most highly esteemed in England. Their cost was surprisingly small; a boy could be enrolled at Westminster for £20 per annum for board and five or six guineas for tuition. These schools taught Latin and Greek extremely well, and fostered public spirit, stoicism, and honor. Gibbon says of them:

I shall always be ready to join in the common opinion that our public schools, which have produced so many eminent characters, are the best adapted to the genius and constitution of the English people. A boy of spirit may acquire a previous and practical

experience of the world, and his playfellows may be the future friends of his heart and interest. In a free intercourse with his equals, the habits of truth, fortitude and prudence will insensibly be matured.

On the other hand these schools were charged with harboring various immoral practices. Parson Adams was of the opinion: ⁹

Public schools are the nurseries of all vice and immorality. All the wicked fellows whom I remember at the universities were bred at them. . . . The first care I always take is of a boy's morals; I had rather he should be a blockhead than an atheist or a Presbyterian.

As rivals to the public schools of the Anglicans, the Dissenters set up academies of their own which almost rivaled the universities, then not open to others than subscribers to the Thirty-nine Articles, in the extent of their curricula, and which surpassed the universities in the diligence of their instruction. At one of them the brilliant Joseph Priestley was introduced to science; in another Thomas Secker, later an archbishop, learned Latin, Greek, Hebrew, Chaldee, Syriac, algebra, geometry, conic sections, French, and Locke's philosophy. These good schools were struck down by the English Schism Act of 1714, which forbade Dissenters to keep any but elementary schools. When the act was repealed in 1718, some of the higher academies, supported by large private endowment, revived.

The teaching of poor children was left to the Charity Schools, of which several hundred were founded in the reign of Anne, many of them by the Society for Promoting Christian Knowledge, incorporated in 1699. These schools taught poor children of both sexes reading, writing, morals, and the dogma of the church of England; the boys were instructed in some handicraft, the girls in sewing. By 1714 there were 5,000 children attending these schools in London, and some 20,000 in the rest of the kingdom.

⁹ H. Fielding: *Joseph Andrews*, ii, 79.

Scotland and America continued throughout the eighteenth century to give the broadly democratic education for which they had laid the foundations earlier. It was generally observed that the common people in Scotland were superior in intelligence to those of other European countries, and that, as Macaulay put it: ¹⁰

Scotland made such progress in letters, in science, in all that constitutes civilization, as the Old World had never seen equaled and as even the New World had scarcely seen surpassed.

European travelers in America, and Americans familiar with Europe, frequently commented on the high level of literacy and intelligence found in the colonies. Nowhere in the world were schools open to so large a proportion of the population—at least of the free, white population. The gratuitous, state-supported schools in the Northern colonies taught the four R's—for Religion was regarded as quite as necessary as Reading, Riting, and Rithmetic. In addition to the elementary schools there was a sufficient number of Latin schools to feed the universities; and there were several academies founded in imitation of Franklin's to give a practical business training.

Close upon the heels of the Anglo-Saxons the Prussians followed on the road towards universal education. Frederick William I in 1717 made primary education compulsory in his realm, and founded seventeen hundred schools to meet the needs of the poor. To him also is due the foundation of a Royal Academy at Berlin (not to be confounded with the Prussian Academy of Sciences) for the education of young nobles and gentlemen in the service of the state. The ordinances, drawn up by the Count von Wartenberg in 1705, excited so much attention abroad that they were translated into English by the Deist Toland and praised by him as

restoring learning to itself, stripped from all the disguises of pedantry, jargon, and chimæras, and freed from the servile fetters of systems, commonplaces, childish ceremonies, and ridiculous habits.

¹⁰ *History of England*, v, 225.

The subjects taught at this school were riding, fencing, dancing, morals, politics, laws, sciences, and the French, Latin, Italian, Spanish and English languages.

Somewhat similar to this institution were the numerous knights' schools or "young gentlemen's finishing schools" throughout Germany, intended to give polish and aristocratic manners to the sons of the nobility.

In general, elementary instruction changed less than did that of the universities. The three grades of Latin schools, village primary, middle, and higher classical, remained much as they had been since the sixteenth century. Latin, as a necessary tool for the scholar, the scientist, the theologian, the jurist, and the medical man, continued to be the staple of instruction. Greek became more common after 1750. More emphasis was increasingly put on German, French, history, and natural science, and less on religion. For a narrowly sectarian catechism many schools substituted a broad creed of faith in God and in duty. Slowly pedagogical methods improved. The idiosyncrasy of each boy was observed; learning by rote gave place to instruction aimed at cultivating reason and judgment. Technical training for business and the mechanical professions began to be supplied when Johann Julius Hecker in 1747 founded at Berlin a *Realschule*, so called because its purpose was to "teach the pupil not mere words but *realia*, that is, subjects likely to be useful in after life, explained from models, from plans, and from nature."

In almost all educational fields Protestant Germany during this period won back the leadership that had been wrested from it by the Jesuits of an earlier age. The general decline of Catholic schools was due first to the continued hold of the Jesuits and afterwards to their fall. The order remained hostile to all that was new in science and philosophy. Descartes, Locke, and Leibniz were ignored. In 1730-31 the General Congregation of the order passed resolutions stating, contrary to the fact, that nothing in modern physics contradicted Aristotle, but that all stood in close agreement with him, and adding that the Stagirite's

books were so useful to theology that they must remain in the schools. In 1725 Jesuit institutions of learning in the German Province (including Germany, Austria, Poland, and the Netherlands) numbered 209 colleges or high schools for the laity, six colleges for members only, 73 primary schools, and 89 seminaries for priests. The size of the colleges varied widely; the smallest had a staff of twenty persons, three professors of classics, three priests, of whom one should be rector, seven scholars intending to be Jesuits, six lay brothers, and one corrector, or whipper, not belonging to the order. Narrow and old-fashioned as their teaching often was, the suppression of the order in 1773 struck a hard blow at education in all Catholic countries.

In France this blow came a little earlier than elsewhere with the expulsion of the order from the kingdom in 1761. This necessitated the intervention of the state, both to supply new teachers and to overhaul the curriculum. *Bureaux d'Administration* were founded in 1763 to take over the Jesuit schools. An attempt was made to get lay teachers. The Jesuit curriculum was condemned, by Voltaire and others, as including no French history, no French law or politics, no mathematics, and no sound philosophy. To outline a new curriculum La Chalotais drew up his *Plan d'Éducation nationale* (1763) demanding the study of French, Italian, English, German, modern history, geography, economics, politics, and the natural sciences. To train teachers the Collège Louis-le-Grand was turned into a normal school.

Even after this reform, and still more before it, the classics furnished the staple of instruction. The literature and thought of the age bear evidences of the rhetorical stamp put on them by a method that placed the emphasis upon rhetoric rather than upon reason, upon words rather than upon things. The boys would be given subjects for composition such as "a young man explains his reasons for wishing to die," "the remorse of Nero after murdering his mother," and "the speech made by the serpent to Eve when he seduced her." These subjects did not evoke a boy's powers of observation and reason. Few boys, even in Jesuit

schools, wished to die; still fewer, even under the tuition of the casuists, had murdered their mothers; none of them had much experience with talking serpents or with naked women in paradise. The exercises called only for memory, and demanded only a rehash of phrases used by Cicero, Virgil, Boileau, or Racine. After the expulsion of the Jesuits the progress of studies approved by the progressives was slow but sure. Science was introduced and even demonstrated by experiment. Descartes and Malebranche, and even Locke and Condillac, began to be taught, against the strenuous opposition of the church.

In France as in many other countries the education of the poor was left to charity. Jean Baptiste de la Salle (1651-1715), a priest and canon of Reims, founded the Order of the Christian Brethren, which began to function in 1685, but did not win papal sanction until 1724. The purpose of the order was to establish elementary schools for the poor. Such institutions, so far as they existed at all, had sunk very low, being staffed by old-clothes men, decayed inn-keepers, unemployed cooks, masons, wig-makers, and puppet showmen—in fact by the refuse of society. In 1685 La Salle opened at Reims his seminary for school-masters, and soon after that schools for poor children. In these he taught gratuitously reading, writing, spelling, arithmetic, the catechism, and some manual training for trade. The discipline was severe, and the religious instruction plentiful. After suffering a castigation with the whip, a boy was obliged to kneel and thank his teacher for the kindness thereby done him.

In other Latin countries education remained in the hands of the clergy. If the theory of Shaw and Bertrand Russell that parents are the worst persons to bring up their own children is right, the boys of the Italian aristocracy enjoyed exceptional advantages. Put out to nurse as babies, consigned to a pedagogue a little later, and then sent to college and the university, they saw very little of their fathers or mothers. While some profited by their studies, most of

them learned best the arts of dress, of good cheer, of enjoying the theater, of betting on horses, and of gaming.

With his universal zeal for civilizing his people, Peter the Great established some advanced schools in Russia. Some of them taught the technical arts of the engineer, the navigator, and the accountant; others specialized in foreign languages, manners, and etiquette. Though excellent, these schools were few in number. A second reform, half a century later, was carried through by Catherine II. Steeped in the ideas of the Enlightenment, she employed Diderot and studied Locke in order to draw up an ideal curriculum which she hoped would produce "a new human race."

3. PEDAGOGICAL THEORY

The great abundance of writings on the theory of education during the Enlightenment witnesses the importance attributed by that age to training. Naturally, the age of reason would see much value in fostering reason: the age that explained the sufferings of humanity as due to ignorance and blindness would try to remedy the evils by curing their causes; the age that held, with Locke, the mind to be a blank page on which anything might be written, would estimate highly the possibilities inherent in early training. The ideals of the leading educational theorists of the period were more scientific, more secular, more democratic, more utilitarian, and more humanitarian than had been those of their predecessors. The newer studies were given a larger place beside the old classics and catechisms; the claims of ever larger classes to knowledge were admitted. The duty of the state to provide general education was recognized. Above all, there was a strong effort, culminating in Rousseau, to make education "natural"—to free the child from the tight swaddling-clothes of convention and allow it to follow a course of studies congenial to the growth of its mind and psychologically fitted thereto.

The foundations of the educational theory of the Enlightenment, as of its philosophy in general, were laid by

John Locke. Though somewhat influenced by Montaigne, Milton, Fénelon, and other earlier writers on the subject, he was far more indebted to his own discoveries in psychology. Thinking the mind of the child at birth "a blank page void of all characters," or "wax to be fashioned and moulded as one pleases," he was convinced of the great importance of early impressions. Esteeming reason sufficient for the discovery of truth, and truth as the highest possession of man, he naturally emphasized the cultivation of the rational element in man's nature. In his first work on the subject, *Some Thoughts on Education* (1693) he compromised with traditional views; but in his second treatise, *On the Conduct of the Understanding* (published posthumously, 1706) he envisaged only one problem, that of strengthening the rational faculties of the mind. In addition to these tracts, he wrote a memorandum on the reform of the Poor Law, from which may be gathered his ideas for the training of the lower classes.

His *Thoughts on Education* assumes sufficient wealth on the part of the parent to provide the best environment and to employ the services of private tutors. Setting as his ideal "a sound mind in a sound body," he begins by stressing the importance of health, and by recommending simple means to secure it: fresh air, exercise, plenty of sleep, plain diet without wine or strong drink, very little physic, light and loose clothing. From the earliest years virtue is to be inculcated, virtue being defined as the child's "ability to deny himself his own desires, cross his own inclinations, and purely follow what reason directs as best." Corporal punishment and bribery by rewards are to be used sparingly; praise and blame should be the chief stimuli to good behavior. Play should be allowed without restraint; teaching should be by practice rather than by rote; the natural aptitudes of each child should be studied. Manners are very important and are taught best by example at home. Tutors are to be preferred to schools, provided the tutor is virtuous, cultivated, and well-bred. Religion should be taught by prayers; superstition should be eliminated from the

nursery. Wisdom and "the ability to manage his affairs in this world with foresight" are to be early engrafted on the budding mind.

Last of all comes book-learning. Reading, writing, drawing, French taught orally, and Latin, if possible, in the same manner, arithmetic, geography, geometry, history, and astronomy should be the first subjects mastered. The adolescent should study ethics in the Bible and in Cicero, law in Grotius, Pufendorf and English jurists, rhetoric and logic in Chillingworth and Cicero. Great pains should be given to the writing of good English. Natural philosophy should be learned from "the incomparable Mr. Newton"; Greek is unnecessary to all but professional scholars. Some attention should be given to dancing, music, and riding or fencing. Every gentleman's son should learn a manual trade as a hobby, if for no other purpose. Travel should come either early, before a boy can be corrupted, or when he is quite mature and settled in character.

Very different were Locke's ideas of the proper training of plebeians. As "knowledge and science in general are the business only of those who are at ease and leisure," it would be vain to waste time in giving them to the workers. Their children should be taught spinning, knitting, or some other manual employment, and nothing else except religion, which is necessary to their salvation in a future life and to their virtue in this.

Notwithstanding the protests of conservatives like Dr. Johnson, who preferred the traditional classical highway, who "hated by-roads in education," and who thought that "education is as well known, and has long been as well known, as it ever can be," the newer ideas began to diffuse themselves among wide circles. Thomas Gray wrote a poem on *The necessary Alliance between a good form of Government and a good mode of Education to produce the happiness of Mankind*. From his own observation and from his main source (Montesquieu's *Esprit des Lois*) he took the idea of the duty of the state to provide a sound

training for its children, and the notion of the connection of good government with such a training.

Lord Chesterfield (1694-1773) took great pains with the education of his natural son, Philip Stanhope, to whom he wrote those charming letters that do *not* teach (*pace* Dr. Johnson) "the manners of a dancing master and the morals of a whore," but the best manners ever taught, and the morals of a man of honor who is also a man of the world. The studies he prescribed were French, Latin, German, Italian, history, geography, law, and a little science. But what he cared for most were the graces, among which were included courtesy, dignity, the art of witty conversation, correct dress, and elegant tastes.

Oliver Goldsmith wrote an essay on education to argue that public schools are better for boys than tutors, because "it is not from their masters but from their equals that boys learn a knowledge of the world." Boys should not be corrupted by romances of gifted libertines like Tom Jones, but should be instructed by moral tales of virtuous youth rewarded for a life of godliness and sobriety by attaining the office of Lord Mayor and by marrying "a lady of great sense, fortune, and beauty." Boys should be taught manual arts and physics by experiments with phosphorus, artificial pyrites, magnets, electricity, and air-pumps, which they would find "a pastime at school and an amusement at college." History should be taught by means of interesting stories. Too many subjects should not be attempted, for they will make the child "a talker in all matters and master of none." The classics and the rod are necessary.

Benjamin Franklin's ideas of the best education may be gathered from the curriculum he proposed for his Philadelphia Academy. After learning the English grammar, spelling, and the art of reading aloud with expression, the boy should be taught to write pure English. History should be read in good authorities, beginning with Rollin's *Ancient History*. Morals should be taught from Johnson's *Elements of Ethics*. Natural science and mechanics are stressed. Above all the boy should learn to enjoy and imitate the best

English authors, among whom are especially recommended Tillotson, Milton, Locke, Pope, Swift, Addison, and Steele. The only foreign author recommended as worthy of study is Fénelon, whose *Télémaque* had been translated. This curriculum is even more remarkable for what it omits than for what it contains. No ancient classics, no foreign tongues, no courses in religion, are included. From other works we know, however, that Franklin valued foreign languages, several of which he taught himself in mature life.

In some respects reactionary, in others progressive, were the ideas set forth by Vico in two works: *On the Aims of Education* (1699), and *A Plan for Studies suitable to our Age* (1708). In the first oration he expounded his program in some such words as these: "That we should cultivate the divine force of the mind and form it in virtue and wisdom; that we should flee vain learning and curiosity; that we should instruct everyone in the common good; that we should glorify arms and empire; and that we should enlarge the good of human society by religion." Less high sounding, but more practical, are the recommendations of the second tract, to the effect that the best studies for youth are mathematics, physics, chemistry, the use of microscopes and telescopes, medicine, poetry, and law.

The first, in fame as well as in time, of the German educational theorists of this period was the many-sided Leibniz. The postulates of his system were laid down in a tract *On a New Method of teaching and of learning Jurisprudence*¹¹ (1667), which is really a profound examination of pedagogical principles. Two centuries and a half before our own great educational philosopher John Dewey, Leibniz saw that the value of training lay in the implanting of correct habits of action. "My plan of studies," said he, "is a method of coming to a state of perfect actions"; its aim is "a habit of mind which I define as a permanently acquired promptitude of acting." With remarkable insight he compared the training of young animals, by association of stimulus with act, and by trial and error, with the education of children.

¹¹ Leibniz: *Sämtliche Schriften und Briefe*, vi, 260 ff. (1930).

In a memorial written for Peter the Great, Leibniz proposed what he considered the best course of study to form a man of the world. The first six years of a child's life would be well spent in acquiring the mother tongue and Latin, both by the natural method of use. During the next six years, at school, the boy would form his character and master the arts of correct speech and composition, and learn history, mathematics, optics, mechanics, astronomy and natural history. The next period, from his thirteenth to his eighteenth year, the boy should spend at an academy pursuing scientific studies, economics, medicine, jurisprudence and theology, together with Greek, Hebrew, French, Italian, and public speaking. After this he should spend two years in travel.

Elsewhere Leibniz modified and simplified this curriculum by omitting all that was not useful to life. A pupil's time would be economized if he learned but one language and passed over studies of purely conventional value, such as ceremonies, positive laws, and the greater part of classical erudition. History might be reduced to an outline. With the time saved the pupil might progress far in what Leibniz called the really useful studies of logic, rhetoric, mathematics, natural science, economics, and politics.

Against Leibniz's preference for the natural sciences a strong reaction led the conservatives to emphasize the value of the classics. Ernesti, in a work on *The Beginnings of Sound Learning*,¹² said:

Whoever studies the ancient classics and the foundations of mathematics acquires a practiced sense for the discernment of the true from the false and the beautiful from the formless; he also stores in his memory all sorts of fine thoughts and learns how to grasp the thoughts of others and how skillfully to express his own; he also acquires a body of good maxims for the improvement of his will and understanding.

Wieland, too, in a plan for an Academy for training the Mind and Heart of the Young, held up the ancients as the

¹² *Initia doctrinæ solidioris*, 1755, quoted Lamprecht: *Deutsche Geschichte*, VII, i, 338.

models to be studied and imitated. The Greek ideal of *kalokagathia*, said he, aimed to cultivate the qualities and perfections of a noble man by exercise of love and by the taste for poetry.

The Prussian kings took an intelligent and even passionate interest in education. Though Frederick William I made considerable concessions to current practice in his academy for young nobles, his real preferences were set forth in a long memorandum outlining the instruction to be given his son, afterwards Frederick the Great. The first subject, religion, was to be so inculcated as to impress the boy with a love of God and a hatred of Catholicism, and as to leave him in ignorance that there were such things on earth as Socinians and atheists. Instead of Latin, the pupil should be taught to speak and write French and German correctly. The most important subjects of the curriculum, besides these, were to be arithmetic, higher mathematics, artillery, fortification, economics, law, and history, especially the history of his own country for the last century and a half. All of these subjects, except religion, the apt pupil thoroughly imbibed.

When he came to the throne himself, he improved the Prussian schools, especially those of the middle grades. His shrewd practical sense led him to discount the more extravagant views of the *philosophes*, and especially those of Rousseau. He thought that the main value of education lay in disciplining the will, the understanding, the judgment, and the imagination, and in improving the memory.

On the other hand, the principles of Rousseau were imported into German schools by the Philanthropinists and their leader Johannes Bernhard Basedow (1723-76). After publishing books advocating the "natural method" of education and the use of pictures, models, tools, animals, and plants in the instruction of children, Basedow opened a school at Dessau. In this, besides putting the principles just mentioned in practice, he taught French and Latin by conversation, and gave very liberal religious instruction. In most schools, he remarked, the catechism had destroyed

all love of God and the Latin grammar all love of learning.

Some of the French theorists were more influential in their time than any of the German educationalists. One of the first to enter the field was Charles Rollin (1661-1741), the historian, the rector and the reformer of the university of Paris. In an elaborate work on *The Method of teaching and studying Literature in relation to the Mind and Heart* (1726) he set forth his ideas on the training of young children, on Latin and Greek study, on poetry, on rhetoric, on eloquence, on history, on philosophy, and on the government of schools and colleges. He especially favored the mastery of Latin, Greek, the French classics, and history. His compendium of ancient history enjoyed a great vogue for a long time because of the moral edification he contrived to draw from the subject.

Among the *philosophes* Montesquieu advanced new ideas of education in his *Spirit of the Laws*, Book IV. He believed that the system of education prevailing in a nation would always depend on the government. A despotism would allow very little instruction to subjects; a monarchy would stress manners and etiquette; a republic would inculcate patriotism.

The most famous of all works on education ever written is perhaps the *Émile* (1762) of Jean Jacques Rousseau, a work described by him as "the fruit of twenty years of meditation and of three years of labor." He had noted, amid his own hard experiences and in the course of his social studies, that, while other arts were rapidly improving, "the most useful of all arts, that of making men, is forgotten." He set out to restore this art, which, in his mind, of course, was simply that of allowing nature to do its perfect work. Man mutilates and disfigures all he touches, including his own children, because he loves monstrosities rather than natural beings. That education is best which is most natural. A child should be made free above all. First, a baby should be hardened by accustoming it occasionally to bear heat, cold, hunger, and thirst. It should be suckled by its mother and trained by its father. The boy should

be allowed to run wild for many years, bodily health being best promoted by such free exercise. He should be brought up in the country for, according to Rousseau, alone among sociologists, "of all animals man is the least able to live in herds," and "the breath of man is poisonous to his fellows: this is true both literally and figuratively." To insure perfect naturalness, the child should not be allowed to contract any regular habits; he should eat, drink, sleep, and play just when his appetite directs him. His freedom should be so perfect that he should be neither commanded nor forbidden to do anything, still less should he be reasoned with, for reason is the last faculty to develop. He should be guided only by the necessity of things, so arranged by his guardians, without his knowledge, that he shall not be able to do himself serious harm. Moral and social ideas should be suggested to him by object lessons—even when these lessons are really tricks elaborately gotten up, by his father or tutor, to seem natural. For example, we wish to give him the idea of property. First, have a secret understanding with the gardener. Then propose to Émile, the boy, to plant some beans. He does it, after pulling up some vegetables planted by the gardener. The gardener complains; Émile is struck by the justice of his complaint, and thus learns that the garden is property. He further deduces that it is wrong to harm anyone, in property or in person; and this is the only moral lesson he need learn in his early years, according to Jean Jacques.

Book-learning is to be avoided as long as possible. Till he is twelve Émile should not even see a book. Reading is the curse of childhood; moral tales, such as those of La Fontaine, teach false morality by letting him know that there are such things as vice and crime. Let the child *do* things, not *learn about* things. Bring him up like a savage; make his senses keen and his brain alert. Even medicine should be avoided as artificial, and inoculation against small-pox should be shunned.

The first art to be taught should be drawing—and here again Rousseau advocates teaching it by elaborate tricks

in order to make the method seem natural. The teacher should feign at first to draw as clumsily as the pupil, and should gradually correct his own faults, barely hinting to the pupil how this should be done. Geometry should be taught the same way. Rousseau says he knew a boy who was thus taught by being offered a number of isoperimetric cakes of various shapes, and being told to select the one that had the largest solid contents. "The little glutton exhausted the science of Archimedes to discover which cake had the most to eat in it."

Above all, the boy's tastes should be kept simple. Take him to the house of a rich man and then to the cottage of a laborer; he will soon learn to prefer the latter, where he has less ceremony and richer cream. In this the author, who was himself hideously embarrassed in good society, doubtless spoke from the heart.

At twelve or thirteen the boy will begin to feel the need for more knowledge, and it should be given him only as he asks for it. He should learn geography by walks through the neighborhood; cosmography by himself observing the changes of the seasons and of the positions of the sun and stars. Let him make his own instruments and his own clothes: he will dress himself in skins like another Robinson Crusoe. Let him learn a livelihood, and in doing so he will acquire the sciences. Optics will reveal its laws to him while examining a stick that appears bent when partly immersed in water.

The age of puberty brings delicate problems. Better leave him in entire ignorance of sex until he is ready to marry; but if this is impossible, teach him very early, before the passions are likely to be aroused. If he asks how children are born answer him truthfully: "*Les femmes les pissent avec des douleurs qui leurs coûtent quelquefois la vie.*"

Accustom him to see pain and misery. Tell him no one is ever certain of health or good fortune. "Let him see and feel human calamities; shake and frighten his imagination with the perils with which every man is always surrounded;

let him see the abysses all about him." History should be taught to enforce the same lesson of human misery.

Teach him no religion until he is fifteen, or perhaps eighteen. He will never really believe he has a soul if he is taught too soon. When he is quite ripe for it, the grand truths of natural religion should be opened to him. After religion, good manners should be taught him. Further polish is to be given by poetry and the theater.

Now, at the age of twenty-two he should be found a wife. In Sophie, the perfect woman, brought up entirely to fit her for marriage with Émile, his parents find an eligible match. He needs only to be introduced to her to fall in love. He wants to marry at once, but is told that his education needs to be completed by travel. Like the good young man that he is sure to be, he at once sets out on a long tour to study the laws, customs, and government of foreign peoples. By doing this he will infallibly discover the great truths of natural equality and of the social contract, so well expounded by Rousseau in his other works. Émile, in the course of seeing the world, will be kept virtuous by his love for Sophie. With his marriage, his education may be said to be completed.

Such, in brief, is the most celebrated and influential treatise on education ever written, and the worst. Rousseau's method is based on false premises, false deductions, and a false psychology. The facts about human nature and child nature are not as he states them; and, if they were, the consequences he draws from them would not follow. His method is natural only in the sense that it would restore the child to a primitive barbarism from which the race has emerged. In fact, it would make of the boy not a noble savage but a helpless brute, deprived of all the precious heritage of racial experience. The great advantage and the great economy of education is that by it the accumulated knowledge and skill of the race is handed on without necessitating a new start by each generation. It is a capital more precious than the goods inherited by men from their ancestors; what should we say of a people that destroyed all

its houses, ships, tools, and factories with each generation in order to force its children to make them anew for itself?

No child that ever lived, except perhaps Newton, would discover for itself the laws of geometry and optics; no child but a Raphael would learn to draw by Émile's method. Still less would any child discover, or agree to, the principles of politics and of religion set forth by Rousseau as natural. In fact, the author recognizes this when he admits that the boy should rather *seem* to discover truth for himself than really do so. In order to force him to learn the principles of cosmology or of morals, a series of tricks is played upon him, tricks so elaborate and artificial that they make the ordinary artifices of the teacher seem harmless and simple. Even if these tricks were successful at the time, the child would sooner or later discover and fiercely resent the deception practised upon him.

Finally, Rousseau's system is cruel. It is bad enough to harden children's bodies by the drastic means proposed by him, to expose them to hunger, cold, and disease, but it is far worse to torture and terrify their minds by inuring them to scenes of misery and horror. Such a process would make them not stoical and humane but ferocious, timid, and perhaps mentally abnormal.

Nevertheless, it would be unhistorical to see only the evil in this famous book. To appeal, as it did, to its contemporaries it must have had something of value in it; and it did. It was a reaction, healthful had it only been moderate, against some of the worst tendencies of the age. In order to estimate it justly we must remember how artificial, how oppressive, how cramping was most child training at the time it appeared. To overdress, overfeed, overeducate, and strenuously to repress all the natural instincts of childhood was the tendency against which Rousseau too passionately protested. And to some degree his protest was salutary and effective. Better to let a child run naked than to bind it in ruffles and laces; better to let it play all the time than never; better to allow it to have its own way too long than totally to break its will by a course of snubbing, bullying,

and whipping. The ideal of free activity as the best education, the doctrine of human goodness, had in them much of good, though carried to absurd lengths by the great prophet of anarchy.

To what lengths these ideas could be carried was soon shown by some of Rousseau's enthusiastic followers and imitators. One romance, by Barrieu, intended not as a satire on *Émile* but as an improvement on it, told of a boy kept in a wooden cage until he was fifteen and then turned loose on a desert island. Some people brought up their children naked in the woods, calling them together for food by the sound of a bell, like animals; others encouraged their children to practice obscenity in public.

Even such vagaries of freakish disciples gave the book less advertisement than did the persecuting authorities. As no license to print could be obtained in France, it was first published at Amsterdam. Shortly afterwards the Parlement of Paris ordered the author's arrest and the burning of the book by the common hangman. Geneva and Berne made similar decrees. The Sorbonne promptly condemned the book; the archbishop of Paris anathematized it; Pope Clement XIII fulminated against it. Many refutations of its theses appeared.

Some of the *philosophes* and other French thinkers partially adopted the principles of Rousseau, modifying them to suit their special tastes. Many objected to the practice of leaving education to the church. Holbach demanded that it be completely secularized. René de la Chalotais (1701-85), solicitor general of the Parlement of Brittany, in an *Essay on National Education* (1763) advocated direction of schools by the government, and taking them from the hands of the clergy. In his opinion the end of education should be the fostering of patriotism. The child before ten years old should be brought up chiefly by pleasant recreations, such as walks, excursions, merry-making, and games in which the arts of reading, writing, drawing, and ciphering might be imparted. After the age of ten the boy should

devote some years to French, Latin, history, natural science, "the art of inventing," and ethics.

Less in positive than in negative matters were the liberal theorists agreed. They did not always know what they wanted, but they all condemned the prevalent system. Helvétius wrote a tract to show that education was bad, but that it could be good if purged of religion and oriented by lay ethics. Buffon thought that more science should be included in the curriculum. Voltaire condemned the schooling of his age and country by depicting the happy results of an education among the Hurons. Of his *Ingénu* he says:

The rapid development of his mind was due to his savage education almost as much as to the quality of his mind; for, having learned nothing in childhood, he had no prejudices. His understanding not having been bent by error remained in its natural uprightness.

Condillac published in thirteen volumes a very elaborate *Course of Studies* (1767-73) based on lessons he had given to Ferdinand, a grandson of Louis XV. It is a remarkable anticipation of the modern biological doctrine that ontogenesis is a recapitulation of phylogenesis; for the author believed that he had learned from history the natural order of studies. The child should repeat the experience of the race; it should begin with poetry and myth, and proceed through the various practical and fine arts, in the order of their discovery, to modern science. The purpose of his scheme was to make the child thoughtful rather than to cram its memory with facts.

Almost equally elaborate and original is the memoir on a *Plan for a University*¹³ drawn up by Diderot for the Russian government in 1775-76, though not published until 1813-14. "To instruct a nation is to civilize it," he declared; and therefore demanded a free education provided by the state for all its children. In these severe words he criticizes the universities of his day:

¹³ Diderot: *Œuvres*, iii, 429 ff.

In the Faculty of Arts there are still taught, today, under the name of fair letters, two dead languages which are of use only to a small number of citizens, and these languages are studied for six or seven years without being learned. In the name of rhetoric the art of speaking is taught before the art of thinking . . . under the name of logic the head is filled with Aristotelian subtleties . . . sublime and useless; under the name of ethics I do not know what is taught, but I know that not a word is said of the faculties of either the mind or the heart; under the name of metaphysics trifling and knotty points are discussed, laying the foundations of both skepticism and bigotry; under the name of physics there is an endless dispute about matter and the system of the world, but not a word of natural history, of chemistry, of the movements and gravitation of bodies; there are very few experiments, still less anatomical dissection, and no geography.

Instead of this obsolete instruction Diderot therefore gave the preference to science. In detail he proposed this curriculum, for the eight classes into which he divided his university: First class: mathematics. Second: physics. Third: astronomy. Fourth: Natural history. Fifth: chemistry. Sixth: logic and grammar. Seventh: the mother tongue. Eighth: Greek, Latin, and general literature.

To the last we have left a consideration of the education of girls, for it was then wholly different from that of boys, and in general much neglected. Reading, writing, a little arithmetic, the art of housekeeping, and religion, were then thought sufficient to equip any woman for life. "It looks," said Defoe, "as if we denied women the advantages of education for fear they should vie with men in their improvement." Lady Mary Pierrepont, afterwards known to fame as Lady Mary Wortley Montagu, complained that "it is looked upon as in a degree criminal to improve our reason or fancy if we have any." Swift lamented that "not one gentleman's daughter in a thousand should be brought up to read her own natural tongue or to judge of the easiest books that are written in it." Samuel Richardson described the education of Sir Charles Grandison's sister as follows:

Her father, according to the genteelest and most laudable modern education for women, had given her a master who taught her history and geography, in both of which she *acknowledges* she made some progress. In music she *owns* she has skill; but I am told by her maid . . . that she reads and speaks French and Italian and that she writes finely. . . . She is an excellent manager in the family, finely as she is educated. She knows everything, and how to direct what should be done, from the private family dinner to a sumptuous entertainment.

More famous, and too familiar to quote, is Sheridan's satire on girls' education in *The Rivals*, in which Sir Anthony Absolute protests he would as soon have his daughters taught the black art as the alphabet, and in which Mrs. Malaprop agrees that "much learning does not become a young woman."

Notwithstanding all these satires on and charges against women's education, the eighteenth century had some very brilliant and some very learned ladies, who managed to know everything though they had been taught nothing. Fielding depicts, in Mrs. Bennet, a character in his *Amelia*, a blue-stocking who can quote Latin and Greek aptly, though he allows his much idealized heroine only reading of English plays and poetry, of the theological treatises of Dr. Barrow, and of the history of Dr. Burnet. Lady Mary Wortley Montagu learned French, Italian, and Latin surreptitiously. Hume appealed to women as the best judges of historical works. Voltaire's mistress, known to him as the divine Émilie and to the world as Mme. du Châtelet, had mastered several languages and some difficult science and philosophy, on which, and on religion, she wrote several works. Indeed, she was so independent that she preferred Leibniz and atheism for a long time after her famous lover had sought to convert her to Newton and deism.

Several good schools for girls were founded during the period of the Enlightenment. Mrs. Bathsua Makin made plans for a female academy to teach Latin, Greek, Hebrew, Italian and Spanish as well as music, dancing, singing, and keeping accounts. Mme. de Maintenon in 1686 founded at

Saint Cyr a school for girls, famous for the brilliance of its instruction and for the favor of Racine, who wrote for its dramatic presentations his *Esther*. The liberal education, however, made the girls too witty, high-spirited, and worldly for the taste of the founder. After 1692 the school was turned into a convent, where nothing was taught but the four R's.

The problem of woman's education elicited the first classical treatise on pedagogy in French. It was *De l'éducation des filles* (1687) by François de la Mothe Fénelon (1651-1715), that archbishop, saint, and reformer, with the heart of a Quietist and the head of a *philosophe*. He wrote on religion like a mystic, on politics like a monarchomach; a novel worthy of Le Sage and a tract on bringing up girls worthy of Erasmus. Part of his doctrine he drew from his own experience as courtier and as director of a convent; part from St. Jerome's epistle to Læta (no. CVII) and part doubtless from other sources, perhaps from Quintilian, or Erasmus, or Vives. He begins by drawing a sad picture of the neglect of girls' education, a picture colored by reminiscences of Molière's *Femmes Savantes* and *Précieuses Ridicules*. The sexes, he postulates, should be brought up differently with a view to their different functions in life—boys to be soldiers, governors, priests, or artisans, girls to be good housekeepers, wives, and mothers.

Like all sound educators Fénelon emphasized the importance of health and of play. Children's love of imitation and natural curiosity should be used by their tutors; they should be taught by example and rather interested than forced. They should be ruled by love, kept from bad companions, and given beautiful picture-books and stories to arouse their attention. Morals and religion are naturally stressed by the good abbé. Boys and girls, he said, should be separated early. They should be told the Bible stories and informed that God sits on a throne with eyes like sunbeams to see everything. The common faults of girls, talking too much, immodesty, and vanity should be promptly corrected. They should be given household duties very

young, and should be taught reading, writing correctly, elementary arithmetic, and the rudiments of law—for a lady needs to know what is a will, a dowry, a contract, or a mortgage. Maidens of noble family should learn the rights and duties of landlords. It is useless to teach girls Italian and Spanish, for they would use these languages only to read improper books; if they must have another language let it be Latin. They should read history, ancient and modern, orations, and poetry, but never novels or comedies. Music and painting may be allowed, with proper precautions, to the talented. The best method of giving an education is by a governess. The good father confessor warns against convent schools because, he says, in them girls get an exaggerated idea of the attractions of the world, which is there spoken of as a place of dangerous enchantment.

After he had published this tract, Fénelon was appointed preceptor to the Duke of Burgundy, the young son of Louis XIV. For him he wrote some fables, some *Dialogues of the Dead*, and a charming, though slightly priggish and pedantic, romance, *Télémaque* (1699). In this he pictures Telemachus, the son of Odysseus, setting out from Ithaca with a wise old friend named Mentor, to find his long absent father. His travels in the Levant resemble the grand tour then fashionable among the sons of the rich and noble. The young Telemachus sees the works and profits by the wisdom of the Egyptians, and he studies the commerce of the Tyrians. In some countries he learns the arts of war and government; in others he is tempted to dissipation, but resists. He even visits the world of the dead to see the pains of the wicked in Tartarus and the joys of the good in the Elysian Fields.

CHAPTER XIII

RELIGIOUS REACTION AND REVIVAL

I. CHARACTER OF EIGHTEENTH-CENTURY CHRISTIANITY

Though religion is the most stationary of all human institutions, preserving like fossils primeval rites and primitive creeds, yet it does change under the impact of social forces. So greatly did Christianity alter its mind and temper in the eighteenth century that some church historians have seen in the Enlightenment a more decisive break with the past than was made even by the Reformation. In this age science and a new philosophy assaulted the old dogmas, destroying some, and deeply coloring others. In this age nationalism more fully than before subjected the spiritual to the temporal power. In this age the rising regard for money tinctured the ethics of the churches with a larger element of secularism, hedonism, and class bias than ever before, making of religion an instrument for guarding the privileges of the rich and for reconciling the poor with their depressed status. In this age, also, the same forces that later made for political democracy caused a series of revolts against the constituted spiritual authorities that took the form of revivals and that laid the foundations of new and more popular religious bodies. The considerable losses of the church, thus openly attacked in some quarters and subtly undermined in others, will be described in the next chapter. Let us turn now to examine the changes that took place within the various Christian communions.

In the chilling proximity of rationalism and worldliness religion, in the established and fashionable churches, lost all the glow and fervor of emotion that had distinguished it in earlier ages. Mysticism and zeal were distrusted and

hated. There was little sense of sin; and small need of salvation was felt. Such interest as there was in theology turned from such questions as justification by faith and the freedom of the will to theodicy and ethics. The mysteries of religion were prudently passed over in silence. Dean Swift instructed a clergyman that, since Providence had intended there should be mysteries in Christianity, it would not be agreeable to piety, orthodoxy, or good sense to try to explain them. Instead of doctrinal disquisitions sermons became moral exhortations. Swift, in the letter just quoted, again expressed the prevailing attitude when he wrote the clergyman:

Reason and good advice will be your safest guides; but beware of letting the pathetic part swallow up the rational. . . . The two principal branches of preaching are first to tell people what is their duty, and then to convince them that it is so. The topics for both these, we know, are brought from Scripture and reason.

In consonance with this spirit preachers endeavored to make men energetic in business, moderate in pleasure, upright, charitable, and honorable. In comparison with the moral urge even matters of cult, ritual, and church government, so passionately disputed in other times, sank into the background. "Where do we find," wrote John Adams in 1770,

a precept in the Gospel requiring ecclesiastical synods, councils, creeds, oaths, subscriptions, and whole cart-loads of other trumpery that we find religion encumbered with in these days? The design of Christianity is not to make good riddle-solvers or good mystery-mongers, but good men, good magistrates, and good subjects.

Next to the ethical element in religion the rational element was emphasized by the average preacher. While the Deist was trying to prove the sufficiency of natural religion, while the man of the world had come to regard the fine distinctions of the various creeds as "so many shades of non-

sense,"¹ the average divine made it his object to prove that Christianity was little more than natural religion accredited by historic proofs. Thus, as Bossuet,² a conservative out of sympathy with the spirit of the coming age, put it:

some Christians robbed Christianity of all its mysteries and changed it into a sect of philosophy adapted altogether to the senses. . . . This opened the way to deism, that is to say to a disguised atheism.

Not coldness and skepticism, however, but superstition and fanaticism were commonly regarded as the chief enemies of sound religion. Especially distasteful to the rulers of the church was that emotional zeal that was soon to revenge itself in various revivals, and that was then branded as enthusiasm. It was abominated equally as an outrage on common sense, as prejudicial to settled orthodoxy, and as dangerous to the established order. It was associated in the minds of the ruling classes with the wars of religion and with the Puritan Commonwealth. It was deprecated by men of good breeding as wanting in decorum and good taste. Above all, it was abhorred by the orthodox divine who felt embarrassed by the necessity of defending revelation in one historical period and denying it in another. The case against it was put by Locke in a passage introduced into the fourth edition of his *Essay concerning Human Understanding*. He there defines reason as

the discovery of the certainty or probability of such propositions or truths, which the mind arrives at by deduction made from such ideas, which it has got by the use of its natural faculties: *viz.*, by sensation or reflection.

Faith is defined as

the assent to any proposition not thus made out by the deductions of reason, but upon the credit of the proposer, as coming from God, in some extraordinary way of communication.

¹ H. Walpole: *Letters*, ed. by Toynbee, viii, 137 (1772).

² *Histoire des Variations*, v, 31 (1688).

Enthusiasm is defined as

a third ground of assent, which with some men has the same authority, and is as confidently relied on as either faith or reason.

Armed with these definitions Locke attacked enthusiasm by saying that it was founded merely in the subjective conviction of the man who claimed the inner light, which was a very unsafe ground for his own belief and one that could not be made evident to others. Claims to inspiration in modern times were therefore commonly treated, as by Shaftesbury in his *Letter concerning Enthusiasm* (1708) as "extravagance or fury," "cant," and "unintelligible nonsense." Indeed, in an age that regarded all belief that God reveals himself by external evidence as superstition and all belief that he reveals himself by internal experience as mad fanaticism, the lot of the apologist for Christianity was hard.

Not less than by rationalism and worldliness was the church oppressed by nationalism. Even the great international society that had long boasted its Catholicism bowed before the conquering sword of the state. During the age of the Enlightenment the papacy declined to its nadir. It suffered from the attacks of rationalism and the campaign of the *philosophes* "to crush the infamous one." "The papal power," wrote Chesterfield, "founded originally upon the ignorance and superstition of mankind . . . is declining of late, in proportion as knowledge has increased." The enemies of the Catholic church also asserted that her principles, by their hostility to those of economists, undermined prosperity. Many appeals to the pope to reduce the number of holidays that handicapped industrialism in Catholic countries, were successful in 1642 and later years, when such reductions were actually made.

Though for different reasons than those which moved the rationalist and the economist, the despot proved equally hostile to the spiritual power. The political theories of the time emphasized the law of nature at the expense of the revealed divine law. The church was no longer regarded as an autonomous society, but as a corporation subordinate to

the state. The monarch of France, long known as the eldest son of the church, aspired to be king and priest in one, and to rule his own people more and more in spiritual as in temporal matters. The declaration of the Gallican Rights of 1682, condemned by Pope Innocent IX in 1691, was made the subject of a treaty between king and pope in 1693. While Louis agreed to allow French bishops to reject the declaration, he obtained papal confirmation of his right to appoint the French clergy. By this compromise Innocent obtained a shadowy moral victory, and Louis obtained all the substantial material gains.

In the German Empire as in France the secular power encroached more and more upon the spiritual. In 1708 Wolfgang Jäger, professor of theology at Tübingen, wrote an official defense of the emperor and an attack on the pope maintaining the following theses:

1. The pope may possess no temporal dominion.
2. The donations of the emperors to the popes give them no sovereignty and may be taken back in case of papal ingratitude.
3. The emperor is the supreme judge of all cases involving the temporal domain of the Roman bishop.
4. The ecumenical council is superior to the pope and is to be called by the emperor.
5. The German church possesses the same rights as the Gallican church.
6. The threat of excommunicating the emperor by Pope Clement IX is an abuse of the spiritual power for worldly ends.
7. The pope may wage no war.

Though fought by the papacy with all its might, such doctrines continued to win favor in the world. The right of each national Catholic church to govern itself through its own bishops was asserted by Febronius (J. N. von Hontheim, suffragan bishop of Trier) in a work on *The Status of the Church* (1763). Though Febronianism was promptly anathematized at Rome, it was welcomed by the rulers of the Austrian Netherlands and acted upon by them.

In Spain and Italy and other Catholic countries the church

found it necessary to make concession after concession to the temporal power. By an edict of 1762 the Spanish government forbade any papal bull, except decisions on matters of conscience, to be received in Spain. Though this edict was later withdrawn, the end aimed at by the government was attained by other means.

In other than Roman Catholic countries the church suffered similar defeats at the hands of the civil power. In 1700 Czar Peter suppressed the Russian Patriarchate and soon afterwards tried to reorganize the ecclesiastical polity on the lines of the Anglican church. In this, and in other attacks on ecclesiastical authority, he was largely successful.

In Protestant lands church government had been in the hands of the civil rulers ever since the Reformation. More and more did the established churches become the handmaidens of the governing classes. When, as in England, the real rulers of the state were the squires and merchants represented in Parliament, they made the church their chief instrument in opposing the tyranny of the throne as well as in imposing their own yoke on the masses. The Revolution of 1688-89 was largely a revolt of the Church of England against a Roman Catholic monarch; the Act of Succession secured harmony between the executive and legislative branches of the government by providing that the monarch should always belong to "the Protestant religion as established by law." The triumph of complete Erastianism was signalized by the suppression of Convocation in 1717. This legislative body of the church, soon after the Revolution, came into conflict with the government of William and Mary, and then with that of Anne, over the jurisdiction of the civil power in ecclesiastical matters, and over the toleration of Dissenters. In 1717 it was dissolved, not to be again empowered to do any important business until 1852.

Soon after the Revolution were formed several religious societies, such as that For the Propagation of Christian Knowledge, which made it a part of their duties to instruct the poor in their obligations and to reconcile them to their

depressed condition. By this, chiefly, they commended themselves to the masters of the state.

As between the various Christian churches the balance remained much the same throughout the period of the Enlightenment. In 1683 the Secretary of the Roman Propaganda estimated the total number of Roman Catholics in Europe as 74,700,000, the number of Greek Orthodox as 27,000,000, and the Protestants as 23,600,000. This estimate erred in giving the Roman Catholics too many, and the Protestants too few. The confessional division largely coincided with political boundaries, though some states, such as the Empire, the Netherlands, and Switzerland, held many of both Catholics and Protestants. On the whole the Catholic states, led by France and Spain, declined, while the leading Protestant states, Great Britain and Prussia, gained ground.

Though interconfessional strife was still bitter enough, it abated something of the ferocity of the previous centuries. In the face of a common enemy the various Christian sects were inclined to relax their mutual animosities. In contact with other world-religions Christians of all creeds were made conscious of their similarities rather than of their differences. A growing indifference in large sections of the public began to regard all forms of worship as more or less alike, and creed as less important than conduct. As Pope put it:

For modes of faith let graceless bigots fight;
He can't be wrong whose life is in the right.

And Gibbon was describing his own age as well as that of the Antonines when he said that to the common man all religions appeared equally true, to the philosopher equally false, and to the statesman equally useful. Swift, though a convinced believer, ridiculed the strife of the churches in his *Tale of a Tub* (published 1704) in which Peter (the Catholic), Martin (the Anglican) and Jack (the Dissenter) fight for their father's inheritance.

The scandal of religious conflict that redounded to the advantage of the unbeliever was felt keenly by many Chris-

tians. Bishop Burnet deplored the debate on the Trinity between the orthodox and the Socinians, because, he said,³

a learned Deist made a severe remark on the progress of this dispute. He said he was sure that the divines would be too hard on the Socinians in proving their doctrines out of Scripture; but if the doctrine could once be laughed at and rejected as absurd, then its being proved, how well soever out of Scripture, would turn to be an argument against the Scriptures themselves, as containing such incredible doctrines.

The quarrel between the Jesuits and Jansenists in France, which became so bitter that the priests of either party refused the sacraments to the adherents of the other side, brought such contempt on the church that D'Argenson said, in 1753:

The loss to religion cannot be attributed to English philosophy, which has won only a hundred followers at Paris; it must be attributed to the mutual rancor of priests, which goes to the last extreme. . . . The next Reformation . . . will banish all priests, all revelation, all mystery. . . . Already one cannot say a good word for the clergy in good company, for one is put to shame and regarded as a partisan of the Inquisition.

In the face of such a situation devout and liberal men made earnest efforts to reconcile the various shades of opinion within the two great churches, and even to reunite the Protestants and Catholics again. Leibniz made the last grandly conceived attempt of this sort, for he fondly dreamed of a universal religion in which all men would reunite in a genuine catholicity. As early as 1679 he planned an apology for Christianity which should conciliate Catholics while convincing atheists. A few years later he pressed upon the Princess Sophia a plan for reconciling the two faiths. According to this each should grant the other tolerance until agreement was reached; the Catholics should make a preliminary acknowledgment that honest error is neither heretical nor schismatic, and the Protestants should

³ *History of my own Time*, iv, 388. Anno 1698.

agree to abide by the doctrinal decisions of a future ecumenical council. Next, Leibniz entered into protracted negotiations with Bossuet, as the Catholic champion who best understood the Protestant position. The German philosopher proposed that the pope should grant the Protestants the same degree of recognition that he granted the Greek church, and should admit the legitimacy of the use of the vulgar tongue in divine service, of communion in both kinds, and of the marriage of the clergy. On doctrinal points Leibniz believed the two creeds nearer than the bigots of either would allow. He thought that he could prove, not from religious but from scientific arguments convincing to all, such mysteries as the real presence in the sacrament. From Newtonian physics he showed that the essence of a body is not matter but motion; and hence he deduced the corollary that, as the sun attracts a body at a distance, Christ might impart the essence of his body to the distant sacramental bread.⁴ Such arguments, however welcome to the scientifically minded Christian, appeared profane to the already convinced theologian. Bossuet replied to Leibniz's advances that religious matters were not like temporal affairs, that could be settled by compromise; for, the true doctrine had been defined once for all at Trent, and must be accepted *in toto* by all who aspired to attain salvation. The disappointed Leibniz answered petulantly that he could never forgive the Council of Trent for having anathematized the faith of the whole ancient church as demonstrated from the Bible. As hope of reunion was seen to be shattered at this point, the argument was continued only by some theologians who hoped to convert their opponents without yielding anything to them.

2. PROTESTANT REVIVALS

Sapped by worldliness, bombarded by rationalism, crippled by internecine warfare, and oppressed by the state, Christianity, at least in its Protestant branch, evinced re-

⁴ *Philosophische Schriften*, i, 75.

markable powers of recovery, of revival, of expansion, and of conquest. Renewal, like decay, was due to the operation of natural causes. The two most general forces that have guided the evolution of modern culture have been science and democracy. These two have sometimes been allies and sometimes enemies. In the great political revolutions they coöperated to overthrow the institutions and classes hostile both to the intellectuals and to the third estate. But in religious and ethical matters science and democracy have often been opposed. The conclusions in these matters acceptable to the highly educated classes were generally repellent to the ignorant. Therefore, while religion lost ground among the worldly wise and cultured, it was able to recuperate by an appeal to the masses. Democracy, as here used, must be understood in the broadest sense as the gradual expansion of the class that effectually moulded public opinion. While political democracy was still far from realization in any state, the steady growth in numbers, in education, in wealth, and in self-confidence of the third estate, and the gradual emergence into public consciousness of the proletariat, were conspicuous facts. The Reformation of the sixteenth century, the Puritan revolution of the seventeenth, and the several revivals of the eighteenth, may all be considered as so many revolts of the unprivileged against the privileged classes, the recognition of the rights of the poor in an important sphere of life, and the assertion of the value of ordinary people. "In gentle folks," said Wesley, "there is very little sincerity; in plain folks there is much." "God in this work," said Jonathan Edwards of the Great Awakening, "has begun at the lower end; and he has made use of the weak and foolish things of the world to carry on his work."

It would oversimplify the facts to see in the revivals merely the revolt of the common man. Many other forces were at work, some in one country and some in another. To a very considerable extent the revivals were reactions against the generally prevailing tendencies of the time. In all fields of human affairs, and in many operations in nature,

the law of oscillation rules. The pendulum carried too far in one direction swings back of its own weight in the opposite direction. Thus, in the age of reason, the religious revivals were revolts of the slighted and suppressed emotions. In the age of science they reasserted the claims of tradition and history. From cold moralism they fled to hot, mystical experience. They eagerly cast off the chains of formalism and decorum to find solace and freedom in extravagant expressions of individual piety. Oppressed by too much sanity, they welcomed the relief of hysteria and absurdity.

Among these Protestant revivals, though in many respects quite different from the others, the first was that connected with the name of Emanuel Swedenborg (1688-1772). Born of a good Swedish family and educated at Upsala, he so distinguished himself in science and in public affairs that he was ennobled by the government. A visit to England made him acquainted with her leading scientists. In geology, in paleontology, and in physics he did good original work, which he published in a journal edited by himself. His lucid accounts of phosphorescence and of some magnetic phenomena have won admiration. He made plans for a flying machine, a submarine, and a machine-gun, all of which remained impractical; and he actually improved the air-pump by the use of mercury. He has been credited with proposing the nebular hypothesis of the origin of the solar system, but his words are so vague and his arguments so inept that Kant (who held the same theory) declared they would rather confirm the reader in the opposite opinion. His best work was in the physiology of the brain. He showed that consciousness, or "the soul," resides in the cerebral cortex; and he traced the connections of different parts of the cortex with various sensory and motor reactions.

In 1745 he experienced a conversion that left him in a state of mystic exaltation. He assures the reader of his voluminous dogmatic and devotional treatises that his visions of heaven and hell were not figments of the fancy but actual experiences. The notes of his theology are the pseudo-

scientific and the erotic. He thought that he could discover the immortal soul by dissecting the brain, and trace the direct operations of spirit in the phenomena of inorganic nature. From God, said he, emanates a spiritual sun, from which emanates the natural sun, from which emanate love, intelligence, and life. The whole of science, history, and philosophy he found in the Scriptures, of which he proclaimed himself to be the authorized expounder, and the Paraclete prophesied in the New Testament. His exegesis is based on a far-fetched allegorical interpretation: the history of Israel depicts the progress of the soul oppressed by the rational mind (Assyria), fleeing from empirical science (Egypt), and coming to the promised heaven of love (Canaan). The tower of Babel is declared to signify self-worship; Shechem defiling Dinah is the infidel corrupting the faith.

The most striking element in Swedenborg's religion was the prominence of the erotic element in his apocalypses. In tracts on *Heaven and its Wonders and Hell*, and on *Conjugal Love*, he proclaimed that the sexual dichotomy exists throughout the whole universe of nature and that sexual love is the heavenly reward. His paradise, though monogamous, is as erotic as that of Mohammed. Modeled on the architypal marriage of Christ and the Church, marriages persist in heaven, the male remaining male and the female female. In beatific vision, which he calls "autopsy," the prophet had witnessed the conjugal love of the spirits of dead men and women, each provided with a suitable partner and all enjoying fellowship like that of earthly marriage, only more pleasant and blessed, and not fertile in children. This conjugal love is both mental and corporeal.

This strange revelation attracted much attention in its own day and later. Wesley found something in it to admire, while he branded parts of it as "whimsical to the last degree." Heine, while ridiculing the picture of the next world, admired the author's individualism. Coleridge declared Swedenborg an excellent naturalist, psychologist, and theologian, and "above all praise as a moralist." The

Brownings and Carlyle were deeply influenced by him. Emerson compared him to Shakespeare as "a mastodon of literature," "a genius who did much for the philosophy of life," and the author of "the most remarkable step in the religious history of recent ages." The pious accepted him as a scientist; the scientists granted his preëminence as a mystic; and the Romantic moralists read into his exaltation of monogamous love all the repressed desires of their own souls.

Much quieter and more normal was the development of Pietism in Germany. The leader of the Pietists was August Hermann Francke (1663-1727) who was "converted" in 1688 about the time he was called to lecture at the University of Leipzig. The somewhat unfriendly reception of him and his followers by the professors is thus described by Leibniz in the *Théodicée*:⁵

Some masters of arts at the University of Leipzig gave private lessons to students in what they called sacred philology. . . . They were accused of uttering extravagant and novel doctrines, and were given the name of Pietists, as a new sect. The name which since that time has made much noise in Germany has come to be applied, rightly or wrongly, to those suspected of fanaticism or even of hypocrisy hidden under the pretense of reform.

So strong did the opposition of the professors become that Francke was expelled from Leipzig, only to be called to a wider sphere of influence at Halle, the most liberal university in Germany. When he visited the Prussian court at Berlin in 1727, the Princess Wilhelmina reported that he "entertained the king by raising scruples of conscience in the most innocent matters. He condemned all pleasures, even hunting and music, as damnable." So austere was his devotion that he forbade not only dancing and the theater to men and women, but even snowballing, skating, and swimming to children, whom he expected to find their "true joy and heart's pleasure in their kind and gentle Savior."

From the university and the court the movement spread

⁵ *Philosophische Schriften*, vi, 59.

through all classes of the population. While Francke stood for Puritan ethics, his friend Spener laid more stress on emotional religious experience. In his autobiography he tells how he conducted revivals and encouraged outpourings of the heart, testimony as to the condition of the soul, and lengthy and intimate prayers. Some of his converts were filled with joy and exultation at the prospect of their certain salvation; others martyred themselves in the fear of damnation.

The most emotional of all the Pietistic communities was that founded by the Count von Zinzendorf and known as the Herrnhuter, or Moravians. With the object of cultivating personal piety, the count evolved an ecstatic mysticism that laid stress on the worship of Christ's body and wounds.

The history of Pietism was short. It founded no new church. It degenerated into morbid introspection, gloomy austerity, and bigoted anti-rationalism. With the coming of the Voltairean enlightenment at the accession of Frederick the Great (1740) there was a strong reaction against it. It still lived on, underground, in the temper of the German burghers, and occasionally sprouted in their poetry. In Klopstock's somewhat overstrained spirituality we find the crowning poetical manifestation of the religious idealism inherent in Pietism.

In some respects similar to Pietism, by which it was directly influenced, but far larger and more permanent, was the Methodist movement in the British Empire. The founder of it was John Wesley (1703-91) who began, as a student at Oxford, to practice himself and to recommend to his friends a special "method" in private devotions that gave his followers the name by which they have since been known. With an almost unexampled consistency he regulated every act and every decision of his life by his conception of the will of God. His unrelaxing attention to his own soul often brought unhappy results to himself and to others. He refused to marry the girl he loved because he thought God did not wish it; later he married a woman he did not love because he thought he could then prove more

useful to God in a married state. The result of this flouting of natural instincts led to great unhappiness to himself and to the women involved. In small matters, too, he was hard, punctilious, and domineering.

But of his consuming zeal there is no doubt. In 1735 he sailed with his younger brother Charles to Georgia to preach as a missionary. On the boat he met some Moravians bound on the same errand; and he was deeply influenced and much encouraged by them. But when he arrived in America he found, to his disgust, that "the Indians had not the least desire to be instructed in religion"; and, he might have added, the whites had very little desire for his ministrations. His censoriousness brought on him an action for libel; and his preaching had at this time little result except a criminal prosecution on ten charges, mostly of an ecclesiastical nature.

When, as a consequence of this rebuff to his first efforts, he returned to England in 1738, he suffered for some time under the horrible conviction that he was in a state leading to damnation, from which he was relieved by a "conversion" and by hearing read a passage from Luther's *Commentary on the Epistle to the Romans*. After a visit to Germany, to learn spiritual religion from the Moravians, he returned to England in order to preach the gospel to the neglected poor. Dogmatically, he had no quarrel with the Church of England, of which he always wished to be a member, but practically he was alienated by its cold formalism and by the worldliness of its clergy. Excluded from the pulpits of his own church, persecuted by her officials, and set upon by mobs, he was forced to erect separate chapels and to preach to crowds of the unchurched in the open air. His efforts were warmly and ably seconded by George Whitefield (1714-70), whom even his enemies conceded to be one of the most effective of popular orators.

The homiletic style of the first Methodists was passionate in the extreme. Either deliberately or unintentionally they evoked the mental conditions necessary for a successful revival: a state of tension, subdued excitement, and expectancy. After congregational singing of emotional hymns

had prepared the audience, the preacher would inject the powerful stimulants of sympathy, of rapture, and especially of terror. Sermons on the awfulness of sin, on the day of judgment, on the eternal torments of hell, frequently threw the congregations into panic manifesting itself by the wildest hysteria, by sobs, groans, cries of anguish, and occasionally by raving mania. Two descriptions of Methodist sermons by eye-witnesses may give the most vivid picture of their style. The first is by Theophilus Evans: ⁶

The manner of the itinerants' holding forth is generally very boisterous and shocking and adapted, to the best of their skill, to alarm the imagination and to raise a ferment in the passions. . . . The preacher has recourse to frightful representations: that he sees hell-flames flashing in their faces; and that they are now! now! dropping into hell! into the bottom of hell! the bottom of hell!

The second description is taken from the autobiography of Benjamin Franklin,⁷ who heard Whitefield preach at Philadelphia in 1739:

It was a matter of speculation to me to observe the extraordinary influence of his oratory on his hearers, and how much they admired and respected him, notwithstanding his common abuse of them, by assuring them they were naturally half beasts and half devils. It was wonderful to see the change soon made in the manners of our inhabitants. From being thoughtless or indifferent about religion, it seemed as if all the world were growing religious.

But this style of preaching, maudlin and ecstatic as it appeared to the cultivated, did fearful execution among the poor and ignorant to whom it was primarily addressed. John Wesley recorded in his diary, with satisfaction, the violent effects of his sermons, effects which he esteemed as signs of God's approving intervention. During the years 1739 to 1743 he reported that his preaching had caused 234 cases of hysteria, manifested in convulsive tearings, trem-

⁶ Quoted by U. Lee, 124.

⁷ *Autobiography*, ed. by Holden, 138.

bling, crying, groans, tears, and occasionally much more serious symptoms. Eighty-five of his hearers, he reported, had "dropped as dead"; two had developed psychogenic blindness, fourteen had been made temporarily insane, and nine had been driven into incurable madness.

The hysterical style of the preaching was not its only dubious quality. The early Methodists revived doctrines long since obsolete, such as the utter depravity of human nature, the vicarious and bloody atonement of Christ, and the necessity of a new birth. Amid the vast hubbub of technical theological terms, of Biblical texts torn from their natural connection, of mystical phrases occasionally bordering on the erotic and denunciations of the wrath to come frequently crossing the line of sanity, amid absurdities in doctrine and prodigies of superstition, we discern one clear message of denunciation of human nature. To Wesley the whole structure of society appeared criminal, less because it is founded on injustice and misery, than because it offers opportunity for sin in the pursuit of pleasure, of power, and of knowledge. He denounced science as leading to atheism, and amusements as roads to hell. "No recreations," in his opinion, "considered as such, can be innocent." One would think that Wesley, as the apostle of the poor, would have supported political and social reforms likely to improve their lot. Far from it. He was as conservative and reactionary in politics as in religion. He stood for passive obedience to the king; wished that George III would act as his own minister as did the French king; opposed concessions to the Americans and to the Irish; denounced Wilkes the champion of Parliament, as seditious; and in general deprecated the reform movement headed by Burke and Pitt that was one of the most beneficent moral forces of the century.

Early Methodism produced many hymns admirably adapted to foster the unctuous and ecstatic piety favored by its leaders. Charles Wesley composed 6,500 hymns, some of which have a certain lyric beauty. Perhaps this was the great age of English hymnody. In 1775 Augustus Toplady,

an Anglican divine and a bitter enemy to Methodism, wrote *Rock of Ages*. During the first half of the century Isaac Watts (1674-1748), an Independent minister of London, indited many fine hymns, of which he said:

It was hard to restrain my verse always within the bounds of my design; it was hard to sink every line to the level of a whole congregation, and yet to keep it above contempt. However, among so great a number of songs, I hope there will be found some that speak the very language and desires and sense of the meanest souls.

Like the Methodists, he dwelt on the terrors of the day of judgment and on the pains of hell:

Hark, the shrill outcries of the guilty wretches!
Lively bright horror and amazing anguish
Stare through their eyelids, while the living worm lies
Gnawing within them.

Like other new and proletarian sects Methodism ran the gauntlet of persecution and of the ridicule of the upper classes. The preachers were often mobbed, and sometimes roughly handled. With one accord the rich, the noble, and the snobs, turned against them. "Their doctrines," said the Duchess of Buckingham,

are most repulsive and strongly tintured with impertinence and disrespect towards their superiors in perpetually endeavoring to level all ranks and do away with all distinctions. It is monstrous to be told that you have a heart as sinful as the common wretches that crawl the earth.

Their doctrines were grossly caricatured, as by Horace Walpole in a letter of 1768:

I hope the Methodist, your neighbor, does not, like his patriarch Whitefield, encourage the people to forge, murder, &c., in order to have the benefit of being converted at the gallows. That arch-rogue lately preached a funeral sermon on one Gibson, hanged for forgery, and told his audience that he could assure them Gibson was now in heaven.

Pope, Fielding, Smollett, and Hogarth satirized them. In *Tom Jones* Fielding speaks of the "pernicious principles of Methodism" as likely to create disturbance; but in *Joseph Andrews* he admits that the hostility of the regular clergy towards them is due to the fear that the Methodists would reduce them to the example of primitive ages. Samuel Foote's successful comedy, *The Minor* (1760) harshly pilloried Whitefield and his followers.

In the face of hostility the early Methodists won an enormous success with the lower classes. Whatever we may think of the value of their message we must admire the courage, the energy, and the skill with which it was delivered. John Wesley visited all parts of the British Isles and many parts of British America. Whitefield, in thirty-four years, preached 18,000 times, an average of ten times a week; he visited all quarters of England, Scotland, Ireland, and Wales, and crossed the Atlantic thirteen times. At Wesley's death, there were more than 71,000 Methodists in the United Kingdom and more than 57,000 in America. And this was just the first beginning of its success. It conquered Wales. It became the largest Protestant denomination in America. It appealed chiefly to the miners and factory workers of Great Britain and to the negroes as well as to the less educated whites of America.

Methodism is the heart of English religion in the eighteenth century. Between the Puritanism of the seventeenth century and the Tractarian movement of the nineteenth, there is nothing comparable to it. The creation of a large new sect was the least important of its consequences. It infected other denominations with its own emotionalism. By giving a little light and a little freedom of expression to the oppressed class, it vaccinated the people against free thought and against political revolt. But it prepared for the Romantic revival; it helped overthrow the age of reason; it gave the English people a substitute for the French Revolution.

Markedly different were the results of the great revival of religion in America, because of the more democratic basis

of society and the freedom of the churches from state control. The foundation of the American religious tradition was the prevalence of sectarian, free churches. As the closest European student of America in the eighteenth century said: "The religion most prevalent in the northern colonies is a refinement upon the principle of resistance; it is the dissidence of dissent, and the Protestantism of the Protestant religion."⁸ These sects were united in nothing but in the communion of liberty. Even where there was an established church it was popularly regarded as no different from any other denomination. And there were even then a vast number of sects: Labadists, Schwenckfelders, Duncckers, Mennonites, Moravians, and Quakers, as well as Anglicans, Baptists, Dutch Reformed, Presbyterians, Congregationalists, and Lutherans. In Massachusetts, New Hampshire, and Connecticut the Congregational church was established; in Rhode Island all denominations were free and equal, as they were in Pennsylvania and Delaware. The New York legislature in 1693 passed an act to establish a church but left it uncertain whether this was to be the Anglican or Dutch Reformed. In Virginia, Maryland, and the Carolinas, the Anglican church was established.

Towards the end of the seventeenth century religion in general and Puritanism in particular began to relax the hold they had had on the first generations of immigrants. Increase Mather lamented the decay of religion in New England and prophesied that "in the glorious times promised to the church on earth America will be hell." So alarmed were the Boston pastors by the lapse of religious faith that they welcomed the epidemics of diphtheria and smallpox in the early years of the century, and the earthquake of 1727, as means to drive the people back to the church. In the other colonies things were, from the point of view of the pious, even worse. In the South only one person in twenty was a church member. In the middle colonies there were

⁸ E. Burke: *Speech on Conciliation with America*, 1775; *Works*, ed. by Bohn, i, 466.

groanings over and denunciations of the prevalent indifference.

Even in the strongholds of the devout and in the pulpits of the clergy, the good, old doctrines of predestination and total depravity began to be questioned. In 1670 Michael Wigglesworth, pastor of Malden, Massachusetts, could still set forth in a poem, then much admired, *The Day of Doom*, the horrors of predestination, the tortures of the reprobate, and the damnation of infants. But in the next century Charles Chauncey and Jonathan Mayhew led a formidable attack on Calvinism. Indeed, they not only offered to prove from the Bible that Calvin had lied about predestination, but they began to sow doubts about the doctrines of the Trinity and of the divinity of Christ. Such were the beginnings of Boston Unitarianism and of the religious liberalism destined to win striking triumphs in the early nineteenth century.

In reaction against the prevailing forces of the time that made for the decay of the church in the world and for the decay of Calvinism and Puritanism within the church, a great wave of religious emotion swept over America, beginning indigenously in Northampton, Massachusetts, in 1734, rising in a few years to a first climax, and then gradually ebbing until it was brought to another flood tide by the preaching of Whitefield in 1739. In many respects analogous to Pietism in Germany and Methodism in Great Britain, in other ways it was distinctively American. Revivalism, though known to all ages and to all countries, found a particularly congenial field in the crude and democratic society of the New World. To a people emotionally and esthetically starved, and yet with senses blunted by hardship and bustle, the revival came as a welcome means of feeling and expression. Moreover, it was the almost necessary technique of arousing the masses, taking the place in religion of the political campaign in civil life. A despotism, either spiritual or temporal, can get along without the active participation of the people; a democracy and a free church can live only by popular interest, and this interest can best be aroused by

drastic means. With most men, especially with the unschooled, reason is a weak force compared with passion.

The prophet of the Great Awakening was Jonathan Edwards (1703-58), a man of equal gifts as philosopher and preacher. Born of the Brahmin cast at Winthrop, Connecticut, he studied at Yale, newly founded to conserve conservatism, to such good purpose that he took his B.A. in 1720. In college began his interest in philosophy and his habit of introspection; and in the last year of college came the "conversion" that put the seal upon his utter dedication to God. Called to Northampton as Congregational minister, his sensational preaching and his severe moral censorship of parishioners, first aroused his hearers to intense enthusiasm and then provoked a reaction so strong that he was unable to find a pulpit among the whites and turned to preach the gospel among the Indians. In the last year of his life he was called to the presidency of Princeton, but died of inoculation for smallpox after six months in that office.

While explaining to the Indians the doctrines of supralapsarian predestination and of the perseverance of the saints, Edwards wrote a remarkable series of works defending the purest Calvinism. The doctrine of the bondage of the will that had so agitated and enthralled the divines of the sixteenth and seventeenth centuries, had never been so philosophically defended as it was by Edwards. Luther, Calvin, Jansen, and Gomarus held the dogma of predestination to be consistent with the exercise of arbitrary choice by the individual in matters indifferent to salvation. Edwards first discarded this position, and brought the predestinarian doctrine into harmony with scientific determinism. The great lesson of Newtonian physics and of Lockian metaphysics, which Edwards had imbibed at Yale, was the rule of inexorable law. Edwards therefore based his argument for predestination on the axiom that all things happen by necessity. This argument he developed in a *Careful and Strict Inquiry into modern prevailing Notions of that Freedom of the Will which is supposed to be essential to Moral*

Agency, Virtue and Vice, Reward and Punishment, Praise and Blame (1754). He argued that nothing can take place without a cause, and that the will always chooses what it considers at the time to be the greatest good. Those who assert that the will can act arbitrarily assert that an effect happens without a cause:

According to their notion of the act . . . these following things are all essential to it: viz., that it should be necessary and not necessary; that it should be from a cause and no cause; that it should be the fruit of choice and design, and not the fruit of choice and design; that it should be the beginning of motion or exertion, and yet consequent on previous exertion; that it should be before it is; that it should spring immediately out of indifference and equilibrium, and yet be the effect of preponderation; that it should be self-originated and also have its original from something else.

The free will is like a monster which should be described by saying that

it begat and brought forth itself, and yet had a sire and dam distinct from itself; that it had an appetite and was hungry before it had a being . . . that it always took a step before the first step.

But, if the human will acts always in agreement with the strongest motive, it must act in obedience to the laws of its Creator. God fixes the conditions of man's choice, and God's will, in turn, is fixed by "a moral inducement, viz., the moral good which he sees in such and such things." His design was that of glorifying himself from all eternity.

Nor did Edwards hesitate to draw from his main thesis the fearful corollaries of the total depravity of human nature, ruined since the fall, and of the election of a few to grace and the reprobation of the many in eternal torment. His sermons dwelt largely upon God's justice in the damnation of sinners, the unavoidable and intolerable pains of the reprobate, and the wrath that shall fall upon the wicked to the uttermost. In his famous sermon on "Sinners in the hands of an angry God," he said:

The God that holds you over the pit of hell, much as one holds a spider over a fire, abhors you and is dreadfully provoked. His wrath towards you burns like fire. . . . You are ten thousand times more abominable in his eyes than the most hateful and venomous serpent is in ours.

It is difficult to see how anyone could hold this awful belief and not go mad. But to Edwards, rapt in adoration of his Juggernaut, "the torments of the wicked in hell are no occasion of grief to saints in heaven," and the dogma of reprobation itself is "a delightful doctrine, exceeding bright, pleasant, and sweet."

The fire kindled by Edwards at Northampton spread to all the colonies. The number of those "converted" has been variously estimated at from 25,000 to 50,000. Most of the conversions were temporary and without lasting effect on morals or religion. Intense opposition developed among the more conservative and decorous clergy; and this gave rise to a schism between the Old Lights and the New Lights. Connecticut herself, the home of the strictest sect of the Puritans, turned against her son with such vehemence that she passed a law against itinerant preachers in 1742, and expelled students from Yale for listening to the revivalists. But though the Awakened fell asleep, and though the Edwardsian theology was more execrated than admired, both revival and philosophy remain monuments to a powerful, if unlovely, genius.

3. CATHOLIC DECADENCE

While Protestantism reacted vigorously against the adverse influences of the time, Catholicism gave way to them. The decline and fall of the Society of Jesus fill the history of the Roman church during the eighteenth century with the tale of defeat. While still admired for the adroitness of its policy, this society was ever more and more severely censured for the laxity of its morals. After the Holy Office had condemned, in 1676, sixty-five theses of moral theology

defended by Jesuit doctors,⁹ the Jansenists continued to press the attack with the aim of having the whole doctrine of Probabilism condemned. Though this was not done by the church, the doctrine was abandoned by some Jesuits, and by most other Catholic moralists.

Another handle for attacking the Society was furnished by its alleged compromises with the heathen religions of China and India. The missionaries allowed the Chinese to worship their ancestors with the ancient rites, on the theory that these honors were not of a divine nature; and they admitted that the God venerated in the Chinese classics was the same as the God of the Christians. By these concessions they won over the Emperor Kanghi, at the same time that they lost the approval of their own superiors at Rome. After several decrees censuring the practices of the missionaries, the Roman Congregation of the Propaganda issued in 1723 a reprimand so severe that it may be regarded as the first step towards the extinction of the Order, which, indeed, it threatened. Charges were brought against the missionaries in India for their concessions to the prejudices of the Hindoos. Recognizing the caste system, the missionaries would minister exclusively to the members of one caste, or else would avoid touching the untouchables by such subterfuges as offering them the sacramental bread on the end of a stick. As the Hindoos abhorred spittle, the Jesuits omitted to use it in baptism; as the Hindoos practised child marriage, the Jesuits sanctioned and solemnized such unions.

Scandal and opprobrium followed the missionaries to the occident as it had followed those to the orient. Charged with sedition, treason, financial corruption, with defending tyrannicide and with aspiring to universal dominion in America, the Jesuits were expelled from Portugal in 1759 and from Spain in 1767. In all, 2,746 Jesuits were expelled from 120 institutions in Spain. So powerful were the Fathers in America that it was feared their expulsion from the Spanish colonies there would lead to social convulsions. Nevertheless, it was effected, with little disorder. Even in

⁹ See this *History*, vol. i, 367 f.

Paraguay, an Indian state ruled wholly by Jesuits, it was found that the natives did not regret the departure of those whom they regarded rather as tyrants than as shepherds.

About the same time France attacked the Order. The trouble here, too, arose in the colonies. The financial failure of a Jesuit enterprise in the Antilles made the whole Company liable for a suit for 1,000,000 livres brought in a French court. Condemned to pay the full amount by a lower court, the defendant, poorly advised, appealed to the Parlement of Paris. This body, filled with Jansenists, not only reaffirmed the judgment of the lower court, but added to the award large damages and interest and opened their tribunal to other creditors of the Order. To satisfy these creditors, the Parlement next seized the whole property of the Jesuits in France, and appointed their enemy, the Abbé Chauvelin, to examine their constitutions. When he reported that the fundamental laws of the Society were repugnant to the constitution of the state, the Parlement of Paris, in 1762, made the confiscation of their property permanent and dispersed their institutions. These acts were justified in a decree, of a Jansenist color, attacking the moral philosophy of the Jesuits as

perverse, destructive of all religious principle and even of uprightness, injurious to Christian morals, pernicious to civil society, seditious, repugnant to the royal prerogative and to monarchy itself, and to the security of the sacred person of the sovereign, and to the obedience of subjects, apt to excite great disturbances in states, and to form and nourish the most profound corruption in the hearts of men.

Most of the other French provincial Parlements followed the example of the Parlement of Paris. Finally, a royal edict of 1764 somewhat attenuated the severity of the laws passed against the Jesuits, allowing them still to live in France as private individuals under the direction of the ordinary spiritual authorities.

The numerous enemies of the Jesuits—Jansenists, *philosophes*, and nationalists—were encouraged by these suc-

cesses to continue the warfare until the final extirpation of the once proud Order. Seeing that it was no longer a support and defense to the church, but rather a scandal and a liability, Pope Clement XIV, plied by theologians and pressed by the great Catholic states, finally dissolved the Order by the bull *Dominus ac Redemptor Noster* in 1773. The bull affirms that the Jesuits no longer bring forth the good fruits for which their Society was founded, that they provoke dissensions with the other orders, with the secular clergy, with the universities, and with princes, that they disturb public peace and the church's tranquillity, that they debate questions repugnant to the orthodox faith and to good morals, that they are too greedy for worldly goods, that they have made scandalous compromises with the practices of the heathen, and that they have been expelled from France, Spain, Portugal, and the Two Sicilies. As all attempts at reform have been vain, the pope concludes the bull by declaring the order suppressed and extinguished.

The suppression of the Jesuits aroused much interest and won general approbation. Jansenists hailed the downfall of the party of free will and lax morality in the church; Protestants exulted in the destruction of the prætorian guard of Catholicism; free-thinkers rejoiced in the prostration of bigots and obscurantists. Only Voltaire doubted the good results of the complete triumph of the Jansenists; while the wolves and foxes are at war, he fabled, the sheep are left in peace; when the shepherds extirpate the foxes, the wolves can turn their whole attention to pillage.

As a matter of fact, Jansenism, persecuted and condemned in the early years of the eighteenth century, attained considerable strength during its middle years. As it had not been completely crushed by the Peace of the Church (1668), its enemies, including Fénelon and the Spanish king, prevailed on the pope to condemn it in another bull, the *Vineam Domini* of 1705. By royal order, Port Royal des Champs was torn down in 1709. The leadership of the scattered group now fell into the hands of Pasquier Quesnel (1634-1719), a Parisian educated by the Jesuits and by the Sor-

bonne only to be converted to both Jansenism and Gallicanism. After his imprisonment in 1704 he escaped to the free Netherlands, in which the strength of the party now lay, and published some *Réflexions Morales* embodying in new form the old Jansenist doctrine. This was condemned afresh by the bull *Unigenitus* of 1713.

After the death of Louis XIV the French government began to show more favor to a party which now made a natural alliance with Gallicanism. So far did the aspirations of some to found a national church go, that in 1718 the Jansenist leaders opened negotiations with the Archbishop of Canterbury to bring their congregations into communion with the Anglican church. Unwilling to countenance such schismatic operations, the French government again turned against the party proposing them, and, by a decree of 1720, imposed subscription to the bull *Unigenitus* on the clergy. This act, however, did not end either the quarrel or Jansenism. Though the universities and other corporations, as well as the vast majority of the clergy, submitted, the spiritual descendants of Arnauld and Pascal continued to make proselytes among the people by their noble faith, their austere morals, their fervent preaching; and they even by producing alleged miracles.

The efforts to found a Jansenist church that failed in France met with success in the Netherlands. In 1723 the Catholics of Utrecht elected a Jansenist archbishop, ever since which date the see has been in schism with Rome. Not only in the Netherlands but in Germany and Austria, the rebels, supported by secular rulers, won a considerable following.

During the height of the warfare between Jansenist and Jesuit the Catholic church first evolved and then condemned a new type of mysticism attractive to those souls who hated the tumult of battle and the fruitless fatigue of dogmatic subtleties. Quietism, as this new mysticism was called, was drawn from older Spanish sources by Miguel Molinos (1628-96) a priest and doctor of theology of the University of Coimbra. After visiting Rome and consulting several the-

ologians, he published in 1675, in Spanish, a *Spiritual Guide* showing the path to a higher state of perfection than that reached by the ordinary believer, a path to be followed by the inner light of immediate inspiration. The popularity of the book, and the large correspondence of the author, won a wide following, especially among women. Presently the Inquisition denounced the doctrines of the inner light and of passive abandonment to God as heretical, raked together 20,000 letters of Molinos, charged him with immorality as well as with false doctrine, condemned his book, and sentenced him to imprisonment for life (1687).

In this very year the new mysticism cropped up at Versailles in the *Short Method of Prayer* written by a rich widow named Jeanne Marie Bouvier de la Mothe Guyon. Like Molinos she disparaged, at least relatively, the rites of the church, and sought salvation by mystical surrender of the soul to God. The book was promptly condemned and Mme. Guyon tried on the charge of heresy. After recantation she was allowed to remain free.

There the matter might have rested, had the cause not been taken up by Fénelon, a grave and gallant churchman with a heart as brave as that of any French gentleman to resist tyranny, and as delicate as that of any woman to savor the refinement, the graciousness, and the unction of well-bred piety. His efforts to prove that the mysticism of Mme. Guyon was identical with the experience of many saints and consisted in nothing but a purely disinterested love of God without fear of punishment or desire of reward, met with the fierce hostility of Bossuet and then suffered the condemnation of the Sorbonne. When finally condemned by the pope Fénelon submitted with the subtle words "the pope understands my book better than I do myself." Thus perished a movement that might have developed along the lines of English Quakerism or German Pietism.

CHAPTER XIV

DEISM AND SKEPTICISM

I. DEISM

While the masses were falling into religious apathy, or were rousing themselves into spasmodic enthusiasm, the leaders of Christian thought were called upon to defend the principles of their faith against the most powerful attack ever yet made upon it. The seeds of Deism, sown in the Age of the Great Renewal, brought forth a large harvest in the Age of the Enlightenment. Nourished by science, criticism, and philosophy, fanned by the winds of freedom, and pruned by controversy, the new religion waxed mightily, drew large numbers from the churches, tintured Christian philosophy, laid the foundations of rational Biblical exegesis, remodeled ethics, effected important political and social reforms, and then died away not as a vanquished cause, but as a movement that had so fully accomplished its purposes as to be no longer necessary.

For easily ascertainable causes Deism reached its first full bloom in England in the half century following the Whig, and the Newtonian, revolutions. To a certain extent it was the expression in religion of the same temper that showed itself in politics in the Bill of Rights and in the restraints imposed by Parliament upon the monarch. Just as the king was bound by law, so, it was thought, was God. Much more, however, Deism owed to the new physics and the new sensual philosophy. The God of the Middle Ages and of the Reformation had been not only a tyrant but a magician, exhibiting his power chiefly by suspending and violating the usual order of nature. The God of the Enlightenment became a mathematician and a mechanic, revealing his perfec-

tion by the formulation and application of inviolable laws. Miracles, special providences, supernatural revelations, were discarded by the Deists not only as incredible in the light of science, but as unworthy of the Creator of the universe and the source of all general truths. When the bias in favor of the supernatural had been discarded, a careful study of the Bible confirmed the rational critic in the opinion that there was no sound historical basis for the special revelation that had become, on other grounds, incredible. The gravamen of the Deistic assault lay in the criticism of Christian miracles in general and of the New Testament wonders in particular. New force was given to the attack on special revelation by the comparative study of religions, and by psychological investigation. The consequent rise of a new philosophy of religion, and of a new method of Biblical and historical criticism, is the most valuable contribution of Deism to modern culture. This philosophy, though an immense advance on the hitherto prevalent theology, overshoot its mark. Far too much the Deist was inclined to attribute the contamination of religion by irrational dogmas and absurd or immoral practices to the ambition and falsehood of priests and prophets. Seldom did he sufficiently allow for the natural growth of myth, ritual, and ethics in primitive social conditions.

From the vantage-point of the twentieth century it is possible to view the warfare of Deism and Christianity as something very different from what it appeared to contemporaries. To the student of our day the cautious conservatism of the innovators is much more striking than is their radical break with the past. To every age its own conflicts seem more fundamental than they do to posterity. The points chiefly debated by Protestant and Catholic in the sixteenth century, the high argument over predestination that convulsed the seventeenth century, now leave us completely cold. Likewise it is possible for us to see that the Deists were not as far removed as they thought from the Christians they attacked. They were convinced of what they called "the sublime and important truths of natural religion," and

these truths were exactly those already recognized by theologians as ascertainable by the unassisted reason. Though the Deists limited the prerogatives of God, and changed the principles on which he chose to act, they retained him as an ethical person, still very anthropomorphic in his nature. They were convinced of a future life of reward or punishment. Above all, they were convinced that the essence of religion is morality, and that the precepts of this morality are exactly those to which the *mores* of their own small society had accustomed them. Their arguments often appear crude; little use is made of natural science; their favorite topics were the improbability of a universal revelation being first made to a small people, the difficulties of the historical evidence of the Bible, the obscurities of the text, the moral paradoxes of the Scriptures, and the sufficiency of natural reason.

One cause of the sudden blooming of Deism after 1694 was the abandonment in that year, in England, of the censorship of the press. Notwithstanding this increased freedom the Deists still fought under heavy handicaps. They were still liable to punishment under laws against blasphemy; other laws, intended for different purposes, were sometimes invoked against them, or applied with increased rigor. Still more did they suffer from general social obliquy. A perfect torrent of ridicule, abuse, and slander poured down upon their every publication. Men of strong religious feelings hated them as infidels; men of the world feared them as disturbers of the peace. Addison disliked them as much as he could dislike anything; Swift hated them venomously; the novelists represented them as futile coxcombs; the divines could find no grounds for their opinions except vicious passions; and even Pope, whose *Essay on Man* was founded on the writings of a Deist patrician, had nothing but sneers for the plebeians of that persuasion.

The critical attack was opened by Charles Blount (1654-93) a brilliant political pamphleteer who, after a life of poverty and petty persecution in Grub Street, is said to have committed suicide because English law prevented his mar-

riage with his deceased wife's sister. Well educated by his father, Sir Henry Blount, he early learned from Hobbes and Lord Herbert of Cherbury the principles he was to expound in his numerous tracts on religion. His first work was entitled *Anima Mundi, or an Historical Narration of the Opinions of the Ancients concerning Man's Soul after this Life, according to unenlightened Nature* (1679). In this he set forth the favorite idea of the Deists that all positive religion is the fraudulent creation of ambitious and greedy impostors. The founders of all religions, in his opinion, deliberately invented heaven and hell in order to control the people. The soul is as mortal as the body; men and beasts are so alike that "some authors are of an opinion that man is nothing but an ape cultivated." The senses are deceitful; all knowledge is uncertain; zealots are more harmful than atheists. In a letter contemporary with this pamphlet,¹ Blount points out that revolutions in religion, like those in politics, have their material causes:

In all mutations, ecclesiastical as well as civil . . . a temporal interest was the great machine upon which all human actions moved; the common pretense of piety and religion was but like grace before meat.

This striking materialistic interpretation of religion, together with an oblique attack on various Christian dogmas, was embodied in a tract entitled *Great is Diana of the Ephesians, or The Origin of Idolatry, together with the politic institution of the Gentile Sacrifices* (1680). Calling to witness the experience of Paul at Ephesus (Acts XIX, 23 ff.), Blount asserts that religion is founded on the economic interest of the priesthood and the political interest of rulers. These privileged classes live and wax fat on the credulity of the people, which, therefore, they sedulously cultivate. A further attack on the miracles of the Gospels is embodied in a translation of Philostratus's *Life of Apollonius of Tyana*, a Greek wonder-worker. Ingenious paral-

¹ *Works*, 158.

els between the heathen and Christian miracles suggest the equal incredibility of both.

A few years later (1686) Blount published *A Summary Account of the Deists' Religion*, advocating a break with the established cult, and the worship of God by moral life rather than by ritual. Inconsistently with his previous position, Blount now professed faith in immortality.

Blount's most important work, *The Oracles of Reason*, was published immediately after his death (1693). The gist of it is a hostile examination of the miraculous and eschatological elements in the Bible. The early Christians expected the immediate end of the world and were deceived. Such stories as the creation of Eve from a rib, the age of Methuselah, and the stopping of the sun by Joshua, are fables. The doctrine of original sin is absurd. In short, the whole claim of the Biblical writers to special inspiration is incredible to one who has grasped the immensity and eternity of the universe:

To believe our modern earth (a blind and sordid particle of the universe, inferior to each of the fixed stars as well in bulk as in dignity) to be the heart, the most noble and vital part of so vast a body, is altogether irrational and repugnant to the nature of things.²

To answer Blount's attack Charles Leslie wrote a *Short and Easy Method with the Deists* (1697). He defended the Biblical miracles by alleging that they were so notorious that the accounts of them could not have been falsified or invented. Moses, for example, could not have persuaded 600,000 men that he had led them through the Red Sea on dry land, had it not been true, any more than Leslie could forge a statute-book for England and persuade the whole nation that it was their ancient law.

A much more important apology, because of its author's fame, was Locke's *The Reasonableness of Christianity* (1695). It is more remarkable as a symptom than as a remedy for the disease that was wasting Christianity. Pro-

² *Oracles of Reason*, 55.

fessing to try all things before the bar of reason, Locke accepted, nevertheless, all the irrational elements in the Bible and the creeds—the fall of man, the atonement, the miracles, and the inspiration of the Scriptures. The miracles he particularly emphasized as important and necessary evidences of the divine mission. In a separate work, he defined a miracle as

a sensible operation which, being above the comprehension of the spectator and in his opinion contrary to the established course of nature, is taken by him to be divine.³

With all its good intentions Locke's work was hailed by the conservatives as "a coarse occasion for atheism." The very admission of reason as the arbiter of religious truth enraged the orthodox, especially when it was made by a man whose metaphysics banished some of the traditional proofs of God's existence.

It was, in fact, on Lockian principles that the next great Deist based his attack on revelation. John Toland (1670-1722) was said by his enemies to be the illegitimate son of an Irish priest. His first change of religion was conversion from Catholicism to Protestantism at the age of sixteen. Supported for a while by pious Dissenters at the universities of Glasgow, Leyden, and Oxford, he drifted into London and spent most of his life as a literary waif in Grub Street. His first important tract, *Christianity not Mysterious* (1696) aimed to show that there is nothing in the Gospel contrary to reason nor above it, in other words to reduce Christianity to a republication of natural religion. The book was burnt in Ireland by the common hangman, was presented as a nuisance by the grand jury of Middlesex, was denounced in Parliament, and was so universally anathematized in the pulpit that a peer excused himself for ceasing to attend church by saying that he used to hear about Jesus there, but that of late he heard of no one but Toland.

Fleeing to Germany Toland learned to admire the Prussian schools and was presented to a princess to whom he

³ *Discourse on Miracles, Works*, 1812, ix, 256 ff.

dedicated his next attack on religion under the title of *Letters to Serena* (1704). Their subject is the origin and force of prejudices. The author showed that a man's opinions depend very much less on his reason than on the suggestions he has imbibed in his early years. Even before birth, he claimed, the mind of the fetus is affected by the desires of the mother, or by accidents to her; and immediately after birth "the grand cheat begins to delude us from every quarter." The midwife uses charms; the priest baptizes the child with superstitious rites; the nurse frightens him with bugaboos; the tutor tells him of satyrs and genii; the university indoctrinates him in the current and usually false maxims of the priest and of the governor.

From the standpoint of scientific criticism of the Bible decidedly the most important work of Toland was the *Nazarenus, or Jewish, Mahometan, and Gentile Christianity* (1718). In this he anticipated the later Tübingen school by calling attention to the divergence of the Jewish and Gentile churches. He also attacked the canon by comparing the accepted with the apocryphal writings of the primitive church. Here and elsewhere he tried to give a rationalistic explanation to some of the miracles, as, for example, in alleging that the pillar of fire that guided the children of Israel was nothing but a transported signal fire.

The attack on the Bible was continued by Anthony Collins in *A Discourse on Freethinking* (1713), and *Grounds and Reasons of the Christian Religion* (1724). The first of these tracts tried to discredit the authority of the New Testament by calling attention to the 30,000 variant readings in the Greek text—an argument answered for the learned by Bentley and for the lewd by Swift. The second tract of Collins attacked the argument from prophecy by showing that the orthodox apologists had so tortured the rules of exegesis that they could make any text mean anything they chose.

The same line of reasoning was exploited by William Whiston (1667-1752) a well-known mathematician, who accepted the fact that the Old Testament prophecies were

not exactly fulfilled in the New Testament, and who therefore tried to explain them allegorically. In his opinion Christianity is a "mystical Judaism."

The allegorical escape from literal supernaturalism was found as convenient in explaining miracles as in interpreting prophecies. According to this view miracles are dramatized parables intended to symbolize God's operations on the soul, or to express some spiritual truth. This interpretation was aggressively advanced by Thomas Woolston, a Fellow of Sidney Sussex College, Cambridge, in six *Discourses on the Miracles of our Saviour* (1727-30). His comment on the cursing of the barren fig tree by Jesus illustrates both his method of attack and his provocative language:

What if a yeoman of Kent should go to look for pippins in his orchard at Easter (the supposed time that Jesus sought for these figs) and because of a disappointment cut down his trees? What would his neighbors make of him? Nothing less than a laughing-stock; and if the story got into our Public News, he would be the jest and ridicule of mankind.

But if the story be taken not as a literally true fact but as an image of the curse that fell upon Jerusalem for not bearing spiritual fruit, it might, in Woolston's view, have a higher truth and beauty. Nevertheless, his doubts, which extended even to the literal truth of the account of Christ's resurrection, and his irreverent language gave so much offense that he was deprived of his fellowship, tried on a trumped-up charge of libel, sentenced to pay a fine of £100 and, not being able to pay it, remanded to prison in which he died.

An answer to him was published by Thomas Sherlock, Bishop of Bangor, in a tract called *The Trial of the Witnesses* (1729). Feigning to try the apostles at the Inns of Court for giving false witness of the resurrection of Jesus, Sherlock heard their defense and acquitted them. Of course he really assumed the points at issue, namely, that the Gospels are the genuine works of the men whose names they

bear, and that their authors weighed evidence critically and maintained conclusions in the face of strong deterring motives. At times the whole controversy seemed to center on the question of the veracity of the apostles as men of good or bad character. Not only did the Christian apologists regard doubts of the Biblical narrative as slanders of the apostles and evangelists, but the Deist attackers could often think of no explanation of the incredible elements in the Bible but the fraudulent self-interest of the writers. Peter Annet, in a work called *The Resurrection of Jesus considered* (1744) represented the apostles as impostors making a good living from the alms of their dupes.

The Deists, however, did not rely wholly on criticism of the Bible to establish their idea of a universal faith. Among them there were many who continued to harbor the belief that the principles of a universal religion could be deduced from, and were supported by, a study of all the religions of the world. Heathen and savages, it was maintained, had been thus instructed in natural faith. Pope exclaims:

Lo, the poor Indian! whose untutored mind
Sees God in clouds or hears him in the wind.

And proclaimed that the same God is worshiped under different names in all lands, and in other worlds:

Father of all! in every age,
In every clime adored,
By saint, by savage, and by sage,
Jehovah, Jove, or Lord! . . .
Yet not to earth's contracted span
Thy goodness let me bound,
Or think thee Lord alone of man,
When thousand worlds are round.

Robinson Crusoe finds the savage Friday's mind open to right notions of God, closed to superstitious belief in the devil, and needing revelation to instruct him in the economy of salvation through Jesus Christ. Prévost, in his romance *Le Philosophe Anglais, ou Histoire de M. Cleveland* (1731-

38) praises the natural religion of savages. Lafitau, in his *Mœurs des Sauvages Américains* (1724) depicts natural religion as so perfect that revelation seemed superfluous. Thomas Cook described the religion of the Society Islanders as extremely mysterious: "They emphatically style the Supreme Being the causer of earthquakes; but their prayers are more generally addressed to Tane, supposed to be a son of the first progenitor of nature." They believe in an immortal soul and in two places of future abode, which, however, they conceive not as places of reward and punishment, but as receptacles of the upper and lower classes, respectively. They also believe in particular providences. While it is impossible to suspect the bluff captain of satire, his account casts so oblique a light upon the faith of his countrymen that one is inclined to suspect that it has been somewhat tampered with by the editor who is known, in other cases, to have adapted the crude facts to the prejudices of the reading public.

Other perfectly authentic accounts, however, pointed out disturbing analogies to Christian history and legends in the myths of the heathen. Jesuit letters from Canada reported the Indian traditions of creation and of the deluge.⁴ De Pauw described rites of the Peruvians and Mexicans similar to the eucharist, and their faith in the resurrection of the body like that of the Christians. Many other parallels to Christianity were discovered in pagan faiths, or, if not discovered, were sometimes invented. Montesquieu described his Persian hero, a Mohammedan by faith, as adoring the tomb of the virgin who gave birth to twelve prophets.

The light shed on Europe from the East dazzled her theologians as much as did that from West. The *philosophes* delighted to find in China their moral principles free of Christian dogma. Even some Jesuits were seduced by the beauty of Chinese ethics. Father Louis Le Comte published *Nouveaux Mémoires sur l'état de Chine* (1696) to show that the Chinese had a religion as pure as that of the Jews

⁴ *Jesuit Relations*, vol. lxvii, 132 ff. (1723), and vol. lxviii, 1 ff. (1730).

or Christians and an ancient chronology as well established as, though different from, that of the Bible. This book was condemned as false and scandalous by the Sorbonne. The philosophers, however, continued to exalt the natural religion and good morals of the Celestial Empire. Wolff, in lectures at Halle (1742) so highly praised the philosophy of China that he was held to disparage Christian ethics and to be an atheist. Voltaire declared that the Chinese had perfected moral science, and that Confucius spoke as a sage.

The philosophy of a universal creed was explained by Matthew Tindal (1653?-1733), one of those reconcilers of opposite opinions that always appear in every conflict of reason and religion. This fellow of All Souls College, Oxford, published in 1730 the first volume of a work entitled *Christianity as old as Creation*, leaving a second volume in manuscript to be published after his death. It never was published, however, but was burnt as dangerous to the faith by Bishop Gibson. Tindal drew from the premises that God is infinitely wise, good, just, and immutable, and that human nature is unchangeable, the conclusion that God's law, as revealed to men, must be perfect and universal. Though he believed that the principles of natural religion were thus accessible to all men in all ages, he inconsistently admitted the special revelation of Christianity as exactly identical with the revelation of reason. Christianity he reduced to "the practice of morality in obedience to the will of God," and this morality he defined as acting according to nature in such a way as to promote general health and happiness.

It was perhaps Tindal's work that called forth two of the most famous apologies for Christianity written in that, or in any age, Berkeley's *Alciphron* and Butler's *Analogy*. The mainspring of Berkeley's idealistic philosophy had been the defense of religion. Having repelled the attack of the mathematician in his *Analyst*, he turned to the refutation of the Deists, for whose perversity he could imagine no motive but libertinism. That they were often moral in their own lives puzzled him as an inexplicable inconsistency:

These sages of iniquity [he complained in an essay contributed to the *Guardian* in 1713] are, it seems, only speculatively wicked, and are contented that all the abandoned young men of the age are kept safe from reflection by dabbling in their rhapsodies, without tasting the pleasures for which their doctrines leave them unaccountable.

In order to confute these "blockheads" and "Mohawks," as he calls them, he wrote, while in America, *Alciphron, or the Minute Philosopher*. In this dialogue he exhibited the "free-thinker in the various lights of atheist, libertine, enthusiast, scorner, critic, metaphysician, fatalist, and skeptic." Alciphron, the interlocutor sustaining the part of the sober free-thinker, begins by narrating his religious evolution through the stages of Latitudinarianism and Deism to atheism. He has come at last to see that all religion is but the deception of the people by the priest and magistrate, and that the only reality is "the appetites, passions, and senses, founded in nature." Euphranor, the Christian apologist, replies that the free-thinkers degrade man to the level of the beast: Moschon (Blount) has proved man to be a beast; Gorgias (Hobbes) has shown man to be a machine; Cimon (Shaftesbury) has reduced conscience to a whim; Tryphon (Mandeville) has argued that vices are useful to society.

After demolishing all these heresies, Berkeley continued, in his sixth dialogue, to defend the credibility of the Christian tradition as handed down in the Bible. After passing in review the canon, the alleged testimony of Josephus and of other profane historians, he summed up in favor of the historicity of the Biblical narrative. He even attempted to establish the credibility of the Mosaic account of creation and the chronology of Genesis by accepting profane traditions that would seem to support his view and by casting doubts on the veracity of the Jesuit missionaries who had reported Chinese chronicles of events more than six thousand years ago. In his last book, Berkeley argued that the doctrine of the Trinity and the other apparently irrational mysteries are not absurd, or, at least, not more incompre-

hensible than the postulates of mathematics. The square root of a negative quantity is useful in calculation, though incomprehensible to reason, and may therefore be likened to the irrationals of religion.

The dangerous method of defending Christianity by declaring its mysteries to be no more incomprehensible than are the arbitrary postulates and axioms of mathematics, already suggested by Huet, Bishop of Avranches, in 1679, was worked out much more fully by Berkeley in his *Analyst* than in his *Alciphron*. In this he addressed an "infidel mathematician," probably Halley, with the following words:

Whereas, then, it is supposed that you apprehend more distinctly, consider more closely, infer more justly, and conclude more accurately than other men, and that you are therefore less religious because more judicious, I shall claim the privilege of a Freethinker, and take the liberty to inquire into the object, principles and method of demonstration admitted by the mathematicians of the present age, with the same freedom that you presume to treat the principles and mysteries of religion, to the end that all men may see what right you have to lead, or what encouragement others have to follow you.

The author then continues by showing that many mathematical conceptions are inconceivable, and concludes with the rhetorical question:

Do not mathematicians submit to authority, take things upon trust, and believe points inconceivable? Have they not *their* mysteries, and what is more, their repugnances and contradictions?

A still more famous apology was that published by another Anglican bishop, Joseph Butler (1692-1752) under the title *The Analogy of Religion, natural and revealed, to the Constitution and Course of Nature* (1736). The author's preface states that many people now regard Christianity as fictitious and as a proper subject of ridicule, and proposes to show that the evidence favors its probable truth. For, he added, with reasonable beings "probability is the very guide of life"; and he argued that if the probability of

the truth of religion were but slight, nevertheless a prudent man would prefer to accept it, rather than run the tremendous risks incident to rejecting it, should it turn out to be true. Starting with the postulate of an intelligent Author of Nature, which he thought proved by abstract reasoning and by the general consent of mankind, he continued:

Let us compare the known constitution and course of things with what is said to be the moral system of Nature; and the acknowledged dispensations of Providence, or that government which we find ourselves under, with what religion teaches us to believe and expect, and see whether they are not analogous and of a piece.

The first part of the *Analogy*, on natural religion, aims to prove the doctrines of future rewards and punishments, of the moral government of God, and of man's state of probation on earth. Part two, on revealed religion, argues that a miraculous revelation is not intrinsically improbable, but that its scheme, as far as comprehended by the human mind, is such as might be expected from a good God, and that it is proved by history, by miracles, and by the fulfillment of prophecy.

Whatever the weaknesses of Butler's argument, they were inconspicuous compared to the gigantic paradoxes advanced in a third apology, published at nearly the same time, by a third bishop, William Warburton, an apology to which Dr. Johnson justly applied the couplet of Savage:

Here learning, blinded first and then beguiled,
Looks dark as ignorance, as frenzy wild.

The Divine Legation of Moses (1738), as this apology was named, defended the inspiration of the Old Testament from the attacks of the Deists who had argued the imperfection of a religion ignorant of the doctrine of immortality. Warburton proved the inspiration of the Mosaic law by saying that, as all mankind have regarded the doctrine of immortality as necessary to the well-being of society, and as this doctrine is not found in the Old Testament, the Jewish

religion must have been inspired and protected by an extraordinary Providence, or it could not have existed at all. There is really no parallel to Warburton's argument except the satiric story in Boccaccio of the Jew converted to Christianity by observing the wickedness of the papacy, which he regarded as so monstrous that no purely human institution could survive it.

The effect of these apologies, such as it was, declined somewhat before renewed attacks of two men who, though wishing to be called Christians, had adopted most of the Deist principles. Thomas Morgan, first a Dissenting minister and then physician to a Quaker community, wrote *The Moral Philosopher, in a Dialogue between Philalethes, a Christian Deist, and Theophanes, a Christian Jew* (1737). While the second interlocutor sustains the orthodox position, the former attacks the supernatural elements in Judaism and Christianity, branding the Jehovah of the Jews as a particular, arbitrary, and immoral national divinity, as anthropomorphic as any Egyptian idol. In explaining the origin of myths and mysteries as due to superstition and demon-worship, rather than to deliberate fraud on the part of priests, Morgan marks an important advance in the psychological study of religion.

Another writer, who endeavored to excise a portion of the supernatural element in popular Christianity, and thereby did more harm to religion than did most of its professed enemies, was Conyers Middleton, D.D. His *Free Inquiry into the Miraculous Powers which are supposed to have subsisted in the Christian Church* appeared in 1749, just two years after Hume's celebrated essay on miracles. But while Hume intended to discredit all miracles and all religion, Middleton professed to attack only the miracles attributed to the saints after the apostolic age, the legends of which he regarded as supporting not the primitive faith but only the Roman Catholic church. The Gospel wonders he explicitly accepted; only those of the later ages he rejected *in toto*. And yet the evidence for these prodigies had been considered remarkably strong. Middleton rightly said:

As far as the church historians can illustrate or throw light upon anything, there is not a single point in all history so constantly, explicitly, and unanimously affirmed by them all, as the continual succession of these [miraculous] powers through all ages.

As a careful examination of these accounts proved them to be utterly incredible, Middleton concluded that the fathers of the church were extremely credulous and superstitious, nay, that they were guilty, "not only in general, but entirely and universally, of fraud and imposture." The author drove home the charge of the incredibility of the Christian miracles by comparing them to similar accounts of prodigies in other religions, by exhibiting the absurdity of some of the accounts, and by showing that the legends hang together as in a chain, so that practically all the miracles related must be accepted or else all rejected.

That Middleton was sincere, though inconsistent, in accepting the miracles of the Bible as genuine, is probable; nevertheless the whole tenor of his argument powerfully suggested the incredibility of all religious signs and wonders without exception. This was clearly seen both by infidels like Gibbon and by believers like Wesley. The latter, indeed, wrote Middleton that his book was an insidious and covert attack on all religion, and was intended to prove that "no miracles were wrought by Christ or his apostles . . . and that these, too, were knaves, or fools, or both."

The last notable English Deist was Viscount Bolingbroke (1678-1751) who spent the enforced leisure imposed by a broken political career in composing a series of attacks on Christianity. Though he had little that was new to say, he said it in polished periods then admired as the perfection of English prose. Not caring to publish his dissertations during his life-time, he appointed by his will David Mallet to print them after his death, or, as Dr. Johnson complained, he hired "a beggarly Scotchman to discharge his blunderbuss against religion and morality." His argument, such as it is, is borrowed from earlier writers, and reënforced by branding opponents as fools, knaves, or madmen. A theist

and a bit of a skeptic, he cared less to defend his positive beliefs than to discredit the creeds of Christendom. He threw doubts on the truth of the Biblical history by contending that Moses related matters so much earlier than his own day that he could not have known them, that his account contradicts that of other early authors, that the narrative is intrinsically unacceptable, "being founded in incredibility," transporting the reader "into a sort of fairy-land, where everything is done by magic and enchantment; where a system of nature very different from ours prevails; and where all that I meet with is repugnant to my experience and to the clearest and most distinct ideas I have." The narratives, moreover, Bolingbroke continued, are disfigured by plain evidences of fraud and imposture; every page is filled with gross defects and palpable falsehood; and they are discredited, if by nothing else, by the absurd and cruel character of God as painted in the Old Testament.

When these pamphlets appeared, in 1754, they had already overstayed their market. The rapid decline of English Deism about the middle of the eighteenth century is as remarkable as its sudden bloom in the late seventeenth. All religious controversies, except those carried on by permanent institutions, such as churches of different persuasions, experience the same fate. Every dogma has its day. To one generation a particular religious problem seems vital, to the next generation trivial and boring. Notwithstanding real services to criticism and religious philosophy, Deism was in the main poor in original thought. It fell between the two stools of faith and reason. And yet it accomplished so much more than it intended that it killed itself in fighting its enemy, revelation. The Deists were really deicides: in cutting away the irrational element in Christianity they felled the tree under which they took shelter.

Nor did they ever appeal to any but a small class. Their writers were neither revivalists nor missionaries. How large was their following is difficult to say. It excelled in quality rather than in quantity. Among the wise and the worldly

it won a considerable party. In the late seventeenth century, says Burnet: ⁵

it became a common topic of discourse to treat all mysteries of religion as the contrivances of priests to bring the world into blind submission to them; *priestcraft* grew to be a word in fashion.

The general decline of belief was witnessed in 1699 by a bizarre work by John Craig, called *The Mathematical Principles of Christian Theology*. The author, struck by Newton's law of inverse squares, propounded as a law of history that the credibility of any given event decreases as the square of the time elapsing since it took place. Thus, he argued, the fervent faith of the first Christians had progressively diminished in every age, and was still decreasing so rapidly that it would totally vanish by the year 3150. Before this should take place, however, the author, a pious Presbyterian minister, expected the end of the world.

In the early eighteenth century Swift's satirical pamphlet, *An Argument to prove that the abolishing of Christianity in England may, as things now stand, be attended with some Inconvenience*, bore witness to the general disposition of the world in which all parties seemed bent on destroying the common religion. A few years later (1738) Warburton complained that

Nothing strikes the serious observer with more surprise, in this age of novelties, than that strange propensity to infidelity, so visible in men of almost every condition; amongst whom the advocates of Deism are received with all the applauses due to the inventors of the arts of life, or the deliverers of oppressed and injured nations.

And about the same time Montesquieu declared that there was no religion left in England.

In reality Deism made few converts among the lower classes. That it did so to some extent is proved by the example of Thomas Chubb (1679-1747), a tallow-chandler without learning but with the ability to imbibe from others

⁵ *History of my own Time*, iv, 387.

the leading Deistic ideas and to hand them on in a multitude of popular tracts. At Salisbury he even founded a debating society, which perhaps furnished the model for others. One such is ridiculed by Goldsmith as a club of vulgar and rough plebeians with a constitution beginning:

We, being a society of moral philosophers, intend to dispute twice a week about religion and priestcraft, leaving behind us old wives' tales, and following learning and sound sense.

Towards the end of the period of the Enlightenment, Boswell heard a Deist say there were not above two hundred infidels in England. On the other hand, Wesley complained of the great inroads of Deism, and noted that a Christian once converted to that heresy hardly ever returned to the true faith.

In America Deism flourished as in England. In 1743 Alexander Graham, of Charleston, South Carolina, reported that Rome and the devil had contrived to crucify religion in that province between the two thieves of infidelity and enthusiasm, but that, whereas the latter was subsiding the former continued to prevail. About the same time Dr. William Douglass, a Scottish-born physician who lived in Massachusetts from 1718 until his death in 1752, stated, in an account of the colonies, that the wise and thinking part of mankind had learned to regulate themselves by natural religion only. Deism infected the colleges, and even the pulpit. The Rev. Charles Chauncey, of Boston, in a book entitled *The Benevolence of the Deity*, written before 1755 though not published until 1784, replaced the cruel, inscrutable, and arbitrary God of orthodox Calvinism with a kindly and rational Supreme Being acting only through general laws. An anti-Christian turn was given to the movement by James Parker who published in the *New York Gazette* in 1752, a polemic against revealed and in favor of natural religion, feigned to have been composed by an Indian chief.

The great American Deist was Franklin, who was led to doubt the claims of revelation by reading some of the lec-

tures intended to defend it given on the Boyle foundation. Indeed, in his first break away from Christianity, for a time he swung far in the direction of materialism. As a young man in England he wrote a *Dissertation on Liberty and Necessity, Pleasure and Pain* (1725) of which he was later ashamed as confounding the distinction between vice and virtue. In some articles of belief which he drew up for the benefit of the Junto in 1728 he reduced God to a machine, and denied his providence and man's free will, the idea of sin, and even personal immortality.

From this extreme he soon reacted into a moderate Deism, pragmatic and utilitarian to the core. He reflected that though materialism might be true, it could not be very useful, and that "talking against religion is unchaining a tiger; the beast let loose may worry his liberator." In his autobiography⁶ he confessed his faith in the following words, which represent that faith to have been more consistent throughout life than it really was:

I never doubted the existence of a Deity; that he made the world, and governed it by his Providence; that the most acceptable service of God was the doing good to man; that our souls are immortal; and that all crime will be punished and virtue rewarded, either here or hereafter. These I esteemed the essentials of every religion.

In middle and later life he continued to recommend the worship of God and the practice of virtue. He stated in his epitaph that he expected his body to reappear "in a new and more beautiful edition, corrected and amended by the author." He discouraged attacks on religion, fearing to sap morality, at least among the feeble and ignorant. In late life, while American envoy to Paris, some Frenchman offered him a manuscript of a work against religion—was it Volney with a first draft of *Les Ruines*? Franklin strongly advised him not to publish it. He was the most consistent, the most earnest of the many men of his age who proclaimed that religion is justified by its utility.

⁶ *Autobiography*, school edition, 94.

Though it is sometimes said that French Deism was imported from England, it was really, to a large extent, a domestic product. As the laws of France made direct attacks on Christianity dangerous, they were evaded by anonymity and by various other ingenious methods. The Abbé de Saint-Pierre, in a *Discourse against Mohammedanism*, really beat Christianity over the shoulders of Islam. A purpose hostile to Catholicism also lurked in his proposal that the *Académie des Sciences* should offer an annual prize for the best explanation, by natural laws, of the pretended miracles of "Protestants, schismatics, and Mohammedans."

All the Deistic attacks on the Christian tradition pale before the blazing sun of Voltaire's wrath. As a Biblical critic Voltaire has little importance, for his historical sense, that served him so well in the treatment of profane history, withered away in the heat of his hatred for the sacred chronicles. But, as a disseminator of the liberal views of the Bible that had come to prevail in select circles, he was vastly effective. His very passion, which excited so much resentment in his own day and which overshoots the mark in the judgment of nearly all modern readers, carried a strong appeal to the vulgar. It seems impossible to get a hearing for an attack on generally accepted beliefs unless the attack is charged with emotion. It is impossible to deny with sympathy until one has denied with indignation. The wistful Renan would have been powerless without the preparation made by the furious Voltaire.

The French Anti-Christ's strictures were carried in many a small tract, in many an *obiter dictum*, in some articles in the *Dictionnaire Philosophique*, and in two tracts, one entitled *The Establishment of Christianity*, and one *An Important Examination of Lord Bolingbroke, or The Tomb of Fanaticism*, first published in 1767, though written in 1736. In this last a few hints by Bolingbroke and others are worked up into the most elaborate and the most hostile critique of the Bible that had yet appeared. Much more than from Bolingbroke was borrowed from Annet; and

something from the other English New Testament critics.

The articles in the *Dictionnaire Philosophique* cast doubt on the stories of the miracles, of the massacre of the innocents, of the supernatural darkness alleged to have accompanied the crucifixion, and of the deluge. With reason Voltaire compared the miraculous stories in the Bible to those found in pagan sources, and the development of the dogma of Christ's divinity to the apotheoses of Greek heroes. A hostile scrutiny of the books of the Bible comes to the conclusion that they are all either spurious, or mendacious, or falsified, or immoral, or absurd. Amid this too sweeping condemnation, a few gleams of sound judgment stand out. In evaluating the contradictions of the evangelists, in dating the Gospels after the destruction of Jerusalem in the year 70, in sketching the religious conditions of Palestine, and in making Jesus the head of a Jewish sect rather than the intentional founder of a new religion, Voltaire was on safer ground. For the character of Jesus, whom he calls a "good fellow with the foible of wanting to be talked about," a priest-hater, a coarse peasant, and a fanatic like George Fox, he had no comprehension.

The strictures on the New Testament, however, are mild compared to the vials of wrath poured upon the writers of the Old Testament. Voltaire doubted the very existence of Moses, called the Pentateuch absurd and barbarous, branded the Chosen People as a "horde of Arab bandits" compared with whom the Hurons and Iroquois are humane and civilized, and held up their history to detestation as "a collection of fables equally outraging good sense, virtue, nature, and the Deity."

Voltaire's purpose in all this was not to destroy religion, but to reduce it to reason. He erected a chapel to the Deity on his own estate at Ferney, and sometimes worshiped there. Only, he was convinced, as he wrote in his *Dictionary* under the heading "Superstition," that "whatever goes beyond the adoration of one Supreme Being, and a submission of the heart to his eternal orders, is generally superstition."

In the same *Dictionary* he defined a miracle as a breach of mathematical, divine, immutable, eternal laws. This definition makes a miracle a contradiction in terms. A law cannot be both immutable and broken.

To extirpate superstition, and especially Christianity, was his main object. Even in this he was restrained by his fear of converting the masses to materialism. As he wrote to Frederick the Great in 1767:

As long as there are fools and knaves there will be religion. Ours is the most ridiculous, the most absurd, and the most bloody that has ever infected the world. Your Majesty will do the human race an eternal service in extirpating this infamous superstition, I do not say among the rabble, who are not worthy of being enlightened and who are apt for every yoke; I say among the well-bred, among those who think, among those who wish to think. Their number is not very great.

Elsewhere, Voltaire pointed out that men's religion depends not on reason but on early education and on geography. In his tragedy of *Zaïre* he makes the Mohammedan heroine proclaim this in the lines:

Custom and law alone, applied in early youth,
Have caused me to believe Islam to be the truth.
I see it all! The bent of children's education
Makes their belief and thoughts those cherished by their nation.
Were I an Indian, a false god I should fear,
A Christian girl in France, a faithful Moslem here.

While there may be some doubt as to the sincerity of Voltaire's religion, there can be none of that of Rousseau. While his brain was perplexed by the current controversies of scientists and philosophers, his heart felt a deep need for faith in a God who should some time repay him for his earthly sufferings. As he explained in a letter of 1758:

On these matters philosophy has neither bottom nor limit. Lacking primal ideas and elementary principles, it is only a sea of uncertainty and doubt, from which no metaphysician will ever escape. Hence I have left reason and have consulted nature, that

is to say, the interior sentiment that directs my belief independently of my reason. . . . I believe in God; and God would not be just were my soul not immortal.

In more detail he expounded his creed in *Émile*, under the title of "The Profession of Faith of a Savoyard Vicar." The author depicted a good man and a Catholic priest who, after a period of doubt and of study of theology and philosophy, had at last arrived at natural religion. The inner light had revealed to him a system much like that of Descartes, Locke, and "the illustrious Clarke." By their aid, and by his own reason, the vicar discovered that he existed, that matter outside himself also existed, that some person must have made and animated this matter, that this person is intelligent, and that all is perfect in nature except man. Man, however, by spoiling everything, proves that he is a free agent, and this, in turn, proves that he has an immortal soul. Reflection convinced the vicar that Providence must reward good and punish evil in the next world, and that what is right and what is wrong is immediately perceived by conscience, and is universally held by all mankind. With these truths satisfactorily demonstrated, it is no wonder that the vicar rejected revelation as unnecessary and unproved. Nevertheless, he continued to conform outwardly to the church of which he was a priest, and to inculcate, with seasonable moderation, the esoteric truth to those able to bear it.

German Deism, like that elsewhere, was founded partly in metaphysical speculations and partly in the historical criticism of the sacred books of the church. By far the most eminent of these critics was Hermann Samuel Reimarus (1694-1768) whose study of the Bible, described elsewhere in this volume, has been hailed by modern scholars as laying the foundations of their science. As professor of oriental languages at Hamburg he soon learned the fallibility of the inspired writers, and turned to Deism to replace his lost faith in revelation. To expound his creed, and to support it, he left a vast manuscript entitled *Apology or Defence of the rational Worshippers of God*, for which he could find no

publisher. Seven chapters of this were published by Lessing as *Fragments of an Anonymous Work found at Wolfenbüttel* at intervals during the years 1774 to 1778. Of these chapters four were examinations of the Bible, and three explained the philosophy of Deism. Though this masterpiece was posthumous, Reimarus did publish several books during his life-time of which one, *The Principal Truths of Natural Religion* (1754) has some importance. In it he defended his theism against the attacks of French atheists on the one hand and against the trumpery rites and superstitions of the church on the other. His main appeal in this work is to natural science, in which field he shows enormous reading but little discrimination.

More effective in its time, though less highly esteemed at present, was the work of Johann Christian Edelmann (1698-1767), who, under the influence of Spinoza and the English Deists, began an attack on revelation in tracts entitled *Innocent Truths* (1735-43) and continued it with a treatise called *Moses with uncovered Face* (1740) and a pæan on *The Divinity of Reason* (1741). He exposed the claims of the Bible to inspiration and the inconsistency of the existing orthodoxy with the primitive faith.

More distinctly Christian in sympathy, though deeply tinctured by rationalism, was the liberal theology of Johann Salamo Semler (1725-91). Educated at Halle, the most progressive of German universities at that time, he became professor of theology there in 1753, and wrote a number of works, among them one on the *Liberal Interpretation of the New Testament* (1767) and one on the history of the canon (1771). Influenced by the English latitudinarians, and proclaiming himself a disciple of Erasmus, in whom he thought all that the newer theology had painfully won for itself might be found, he resolved theology into history. Distinguishing the permanent and essential element in religion, which he thought he found in philosophy, from the accidental formulation of it in theology or history, he was able to transform the conception of the New Testament from that of a unified dogmatic text-book to that of an evol-

ing revelation, in which different books expressed ideas in different forms of perfection. He thus became the path-breaker to the historical interpretation of the thought of Paul and the other early Christian writers.

In like manner Lessing tried to understand religion rationally, and to reconcile his skeptical brain with his Lutheran heart. Of all the harmonizers of reason and religion of his age he was so much the profoundest that his work lived long after that of either the orthodox apologists or of the anti-Christian Deists. Convinced that the doctrine of revelation is untenable, he yet rejected the superficial attempts of the Deists to explode it, and to replace it with a patchwork of philosophy and criticism. Though he was unjust to the freethinkers whom he branded as "enemies of virtue, scoundrels, a shame to humanity with a monstrous creed,"⁷ he was right in regarding Deism as a disguised form of Christianity. In order to give reason its due, and yet to retain elements of the Christian tradition, Lessing propounded the doctrines of religious individualism and of religious evolution. "The letter is not the spirit," he proclaimed; "the Christian religion is not true because the evangelists and apostles taught it; but the evangelists and apostles taught it because it is true." And again, in his famous apostrophe to Luther: "Thou great, misunderstood man! thou hast freed us from the yoke of tradition; who will free us from the more intolerable yoke of literalism?"

In 1777 Lessing published fifty-three theses on the *Education of the Human Race*, which he said he merely edited from the manuscript of a good friend, who was probably Thaer, the bookseller. In 1780, this tract was brought out in a second edition, with the number of theses increased to one hundred of which the last forty-seven were written by Lessing himself. The purpose of the whole is to show that the different religions known to history have been steps in a progressive education of the human race in the knowledge of God. From primitive polytheism and idolatry, through the Jewish faith to Christianity, the authors trace the steps

⁷ *Der Freidenker, Werke*, vii, 76.

by which the human race has proceeded, and point out the road by which it will proceed still further; for, the most remarkable thing about the tract is that the authors did not stop at Christianity as the final and absolute religion, but regarded it, too, as but one phase of progress, destined to be improved upon and supplanted in its turn. The idea of religious development, destined to a large future in the nineteenth century, is thus early expressed in a remarkably clear and cogent form.

2. ATHEISM AND SKEPTICISM

The Deists may be compared to the Whigs of the English Revolution of 1688-89; they were constitutional reformers who wished to retain the monarchical form of government, but to put it under the restraint of fixed, general laws. Far to the left of them were groups of religious radicals who were quite prepared to play the part of the regicides of the Puritan or of the French revolution, to try the despot of the skies before a high court of justice and to dispose of him altogether. The most logical and in the end the most dangerous enemies of religion in the eighteenth century were not the Deists, who denied only the supernatural part of the Bible, but the atheists who dogmatically renounced belief in God, and the skeptics who declared knowledge of the ultimate nature of the universe impossible. Though less prominent than the Deists in the early eighteenth century, the more radical parties were destined to a much greater future.

The general causes of the growth of religious radicalism were those already explained in the first volume of this work: the growth of natural science and the rise of the comparative study of religions, and of their psychological bases. The progress of science made incredible the arbitrary element in orthodox Christianity, as well as the vulgar cosmogony. The study of religions revealed their similarities and differences as explicable by material causes, and also exhibited their mutual and rancorous animosities. To the

battle of the sects was now added the warfare of the Deists, those doctors who, in attempting to remove what they regarded as superfluous or diseased organs of religion, killed the patient.

Though earlier ages had produced atheists, the eighteenth century saw the beginnings of that flood tide of godlessness that distinguishes the last two centuries and a half from all previous history. The radical thought of the Enlightenment, destined to become the common thought of the nineteenth century, and the prevailing thought of the twentieth, marks one of the great breaks in the history of culture. Most of antiquity, the Middle Ages, the Renaissance, and the Reformation, had been intensely religious. The Deists themselves inherited this temperament, and took over much of the thought of the schoolmen and theologians. As Carl Becker has recently phrased it, in a brilliant book: "The *philosophes* demolished the Heavenly City of St. Augustine only to rebuild it with more up-to-date materials."⁸

But at last the implications of the new cosmogony, the new history, and the new psychology, became plain to the honest and fearless mind. The realization came gradually, and not all at once, still less as the result of the "influence" of any one man. To quote Becker⁹ again:

It was as if a rumor, started no one knew when, had at last become too insistent to be longer disregarded: the rumor that God, having departed secretly in the night, was about to cross the frontiers of the known world and leave mankind in the lurch.

An attentive ear can hear the rumor, growing in volume slowly throughout the years, not only in the voices of those who proclaimed openly the abdication of the king, but in those who did their best to conceal the fact, either from themselves or from others. There is a new uneasiness, a new doubt, in the arguments of the apologists. There is a reluctance to deal squarely with the fundamental problem

⁸ Carl L. Becker: *The Heavenly City of the Eighteenth-Century Philosophers*, 1932, 31.

⁹ *Ibid.*, 73.

of theism. There is a search for new evidences of God; and a new bitterness in the mutual recriminations of the various schools of thought who each accused the others of drawing conclusions unacceptable to piety and virtue. Above all there is a conspiracy, more determined than before, to hide the dangerous truth from the masses, whose morals the rulers thought it would endanger. There were many men like Sir William Temple, of whom Burnet said:

He thought religion fit only for the mob. He was a great admirer of the sect of Confucius in China, who were atheists themselves, but left religion to the rabble.

There were, indeed, many who argued that, even were religion false, it should be maintained as useful to society and conducive to happiness. Archbishop Tillotson had said that

if there were any doubt of a Providence, it would certainly be very desirable that there should be such a Being of infinite wisdom and goodness.¹⁰

And the same idea was echoed in Voltaire's most famous verse:

Si Dieu n'existait pas, il faudrait l'inventer.

Voltaire's strong opinion of the undesirability of enlightening the mob has already been quoted; as has Franklin's rejection of materialism on account of its disutility. Few indeed were the bold champions of diffusing the truth, regardless of consequences. Among them was d'Alembert, who wrote Frederick the Great:

The question whether it is possible for the people to dispense with fables in religion well deserves to be proposed [as the subject of a prize essay] by such an academy as yours. For myself, I think that one should always teach the truth to men, and that there is never any advantage in deceiving them.

There were other causes for caution than the fear of the social consequences of emancipating the masses. Even more

¹⁰ Quoted by Steele in the *Spectator*, no. 293.

than the Deists the atheists fought under the weight of chains and in fear of heavy penalties—legal penalties in most lands, and social disapproval and ostracism everywhere.

Among the first to accept the new radicalism and to insinuate it in popular writings were the Frenchmen, Fontenelle and Bayle. Fontenelle did as much as any man in the late seventeenth century to advance both the knowledge of the Copernican cosmogony and doubts as to the Christian epic. His tract, *A History of Oracles*, effectively attacked Christian miracles and prophecies by comparing them with the bogus thaumaturgy of pagan priests.

Vastly more sweeping and powerful was the attack on the whole Christian tradition contained in Bayle's *Dictionnaire Historique et Critique* (1697). In this the writer characterized many Biblical miracles as incredible, ridiculed the story of Jonah and the whale, and even cast doubts on the resurrection of Lazarus and of Christ. Such miracles, he argued, are begotten by credulity and abound in the sacred books of all religions. He exploited the controversies of sects and religions to prove that their polemics are mutually destructive, and finally to conclude that custom and education are the sole grounds of belief. Thus, as Gibbon expressed it, "He balanced the false religions in his skeptical scales till the opposite quantities annihilated each other."

Bayle ridiculed sacred history in the articles on Adam, Eve, Cain, Abel, Lamech, Noah, Ham, Abraham, Sarah, Hagar, and David. Not only are the absurdities of the Biblical stories, especially when considered as inspired, brought into high relief, but the shocking morals taught by some of them are emphasized. Though David is ironically admitted to be "a sun of holiness in the church," his adultery, his sensuality, his treachery, his murder of Uriah for the sake of Uriah's wife, and other parts of his conduct, are held up to severe animadversion. When the Huguenot consistory censured Bayle for having drawn a frightful picture of the "man after God's own heart," he rewrote the

article, deleting a few strictures, but adding others. The demand for the original article caused him to reprint it as a separate tract.

Nor did Bayle stop with the criticism of the Bible, in which many Deists would have agreed with him. In his *Dictionary* he inclined to Manichæism; at least he pointed out the disturbing consequences of the Christian doctrine of predestination. If it were true, as almost all Christians held, that many more persons were damned than saved, then, said he, it would seem that the devil had won a signal victory over God. No wonder that the Rotterdam consistory accused him of "giving the victory to a damnable heresy."

Still worse, from the conservative point of view, was Bayle's denial of the evil moral consequences of atheism. After broaching the subject in his *Thoughts on the Comet* (1682) he enlarged the argument and drove it home in his *Dictionary* (1697), in which he pointedly praised the virtues of Epicurus, the Sadducees, Atticus, Spinoza, and other famous disbelievers in a personal God or in the immortality of the soul. Even a whole society of atheists might exist, he argued, without lowering its moral standards. Bayle's Protestant opponent, Jurieu, branded the argument as ruinous to "the whole fabric of religion."

The most powerful apologist for faith produced by that age was Leibniz. He saw rightly the main cause of the growth of materialism in the spread of scientific curiosity. "It is this," he wrote to Arnauld, "that is strengthening atheism, or at least naturalism, and subverting the Christian faith, which has already been given up by many great, bad men."¹¹ Two sects of naturalists he descried: the Epicurean followers of Hobbes and the Stoic disciples of Spinoza. So dangerous were they, he wrote,¹² that

there is no one who does not esteem the battle against the atheists as necessary to the preservation of Christianity. All theologians of all schools ought to join forces to crush these men.

¹¹ *Philosophische Schriften*, 1875, i, 70 f. Letter of c. 1672.

¹² *Sämtliche Schriften*, i, 81 (1669).

And again: ¹³

All the powers of the learned should be united to beat down that monster, atheism, and to prevent this evil from creeping further among us; for from it nothing may be expected but universal anarchy and the subversion of human society.

As a confirmed believer both in religion and in reason, Leibniz was indignant with those who asserted that the two were inimical. Spinoza he disliked because the Dutch Jew branded all that exceeded rational comprehension as superstition. To Toland he wrote that he should distinguish more carefully between superstition and true religion. What irritated him in Bayle's writings was that Bayle contended that

reason is so repugnant to the faith drawn from Holy Scriptures that there is no place left for reconciling them; he goes so far as to say that the dogmas of revealed theology are not only above but against reason, and that they can neither be comprehended by us nor in any wise defended against objections.¹⁴

Among several apologies for Christianity produced by Leibniz, the *Testimony of Nature against Atheists* aimed to show that the postulate of a Supreme Being explains natural phenomena better than does the postulate of purely material forces. The most famous of all his works is the apology entitled *Essais de Théodicée, sur la Bonté de Dieu, la Liberté de l'Homme, et l'Origine du Mal* (1710). Written as a refutation of Bayle's Manichæism and skepticism, this work argues for the existence of God and for his benevolence, and for man's freedom of will. As to the first, Leibniz came to the conclusion:

God is the first cause of all things. . . . This cause must be intelligent, because this existing world, being contingent, and an infinity of other worlds being equally possible and crying, so to speak, for existence, it is necessary that the cause of the world should have regard or relation to all these possible worlds, in

¹³ *Sämtliche Schriften*, i, 85 (1670).

¹⁴ *Philosophische Schriften*, iii, 28.

order to decide on one. This regard or relation can be nothing else but the understanding that has ideas of these worlds; and the decision can be nothing but an act of will that chooses.

Nothing reveals more clearly the perplexity of modern apologists than does their mutual rejection of each other's arguments and their reciprocal charges of aiding and abetting the enemy. Though Leibniz's rival, Newton, was a stout champion of theism, his spokesman, Clarke, and Leibniz, each accused the other of atheistic principles. Leibniz thought that Newton's idea that the universe ran down, like a clock needing to be wound up from time to time, derogated from the idea of God's perfection, without which God could not be held to exist. Clarke retorted that Leibniz's assertion that the universe is a perfect and eternal thing "excludes God's providence and governance out of the world."

Probably the majority of contemporaries interested in the question in debate, sided with Newton, and found his defense of theism fresher and more agreeable than that of Leibniz.

Sir Isaac subjected to a severe scrutiny the body of belief inherited from his step-father, the Anglican divine, rejected part of it, and strengthened the rest with arguments drawn from his own scientific discoveries. Regarding nature as a machine running down like a clock, he concluded that some one must have once wound it up, and that the same power was needed to regulate it from time to time, reducing to order the slight discrepancies not explained by contemporary science. But this almighty Being was of such a nature that he could not be regarded merely as the First Person of the Christian Trinity. Newton therefore scrupled at the doctrine of the Trinity, and endeavored to prove that it could not be derived from the Bible. This did not prevent his accepting Jesus Christ as a divinely inspired mediator between God and man, and the Scriptures as inerrant guides.

As early as 1692 Newton wrote four letters to Dr. Bentley containing some arguments in proof of a Deity, the gist of which is:

The motions which the planets now have could not spring from any natural cause alone, but were impressed by an intelligent Agent.

In the second edition of the *Principia* (1714) Newton added to Book III the following scholium on God:

This most beautiful system of sun, planets, and comets could only proceed from the counsel and dominion of an intelligent and powerful Being. This Being governs all things, not as the soul of the world, but as Lord over all. . . . It is the dominion of a spiritual Being which determines the nature of God: a true, supreme, or imaginary dominion, makes a true, supreme, or imaginary god. And from his true dominion it follows that the true God is a living, intelligent, and powerful being; and from his other perfections that he is supreme, or most perfect.

To the second edition of the *Optics* (1717) Newton added the following passage:

All material things seem to have been composed of the hard and solid particles above mentioned, variously associated, in the first creation, by the counsel of an intelligent Agent. For it became him, who created them, to set them in order. And if he did so, it is unphilosophical to seek for any other origin of the world, or to pretend that it might arise out of chaos by the mere laws of Nature; though, being once formed, it may continue by those laws for many ages. And yet, we are not to consider the world as the body of God, or the several parts thereof as the parts of God. He is an uniform Being, void of organs, members, or parts; and they are his creatures subordinate to him and subservient to his will.

The immense reputation of Newton's science sent his gospel of theism reverberating around the world. With a certain school of apologists, both Christian and Deist, the law of gravitation was long held to be the irrefragable proof of God's existence. It was given a large popular hearing in a lectureship founded by Robert Boyle, the chemist, who in 1691 left by will money to pay a minister to preach eight sermons per annum "for proving the Christian religion against notorious infidels, *viz.*, atheists, theists, pagans, Jews,

and Mohammedans, not descending lower to any controversies that are among Christians themselves."

One of the first to hold this lectureship was Dr. Richard Bentley, who published his lectures under the title *The Folly of Atheism and what is now called Deism* (1693). After applying to Newton for ammunition, he opened fire on atheism by examining the faculties of the soul, the nature of matter, the structure of the human body, and the origin and frame of the universe. He then added that no one can or really does doubt the being of God, and turned to refute Deism.

Locke, too, went to Newton for one proof of the existence of a God. Though he cautioned against allowing a boy to study science before he is well grounded in the Bible, for fear he will turn out a materialist, he added, nevertheless: ¹⁵

Yet it is evident, that by mere matter and motion, none of the great phenomena of nature can be resolved: to instance but in that common one of gravity, which I think impossible to be explained by any natural operation of matter, or any other law of motion, but the positive will of a superior Being so ordering it.

Another apologist to exploit the Newtonian system for the purposes of religion was Samuel Clarke. In two books, originally delivered as Boyle lectures (1704-05), he argued that "because attraction at a distance is absurd, therefore we must postulate a certain immaterial spirit which governs matter according to well-ordered rules." In a chain of twelve propositions he claimed to demonstrate the existence, omnipresence, omniscience, infinite wisdom, and beneficence of the Creator as plainly as Euclid demonstrates a proposition in geometry. In the second book he defended revealed religion.

The current proofs of Christianity were put into popular form by Joseph Addison. "A Sir Isaac Newton," said he,

who stands up as the miracle of the present age, can look through a whole planetary system, consider it in its weight, number, and measure, and draw from it as many demonstrations of infinite

¹⁵ *Thoughts on Education*, ed. by Adamson, 1922, 160.

power and wisdom, as a more confined understanding is able to deduce from the system of the human body.¹⁸

The astronomical argument he put into classic prose in an essay in the *Spectator* (no. 465) and into poetry in a hymn still often sung in churches, "The spacious Firmament on High." Further arguments for theism he drew from biology, stating that the instincts of birds, for example,

are not to be explained by any known qualities inherent in bodies themselves, nor from any laws of mechanism, but according to the best notions of the greatest philosophers it [instinct] is an immediate impression from the first Mover.

Continuing with a proof of revealed religion, Addison worked up Christian antiquities from some of the older and more conservative apologists, such as the Magdeburg centuriators, accepted as credible legends of worse than doubtful value, and so, according to Macaulay, "assigned as grounds for his religious belief stories as absurd as that of the Cock-lane ghost, and forgeries as rank as Ireland's Ver-tigern."

Newton, however, continued to be quoted as a champion of theism by all the more liberal adherents of this doctrine. Voltaire founded his Deism "on Newton and on reason"; William Whiston wrote *The astronomical Principles of Religion* (1717); Nieuwentydt *L'Existence de Dieu démontrée par les merveilles de la Nature* (1725); Lessing cited Newton and other scientists in a poem on God; Reimarus drew from Newton and others the foundations of his natural religion; Cotton Mather wrote *The Christian Philosopher: a Collection of the best Discoveries in Nature, with religious Improvements* (1721) to show that science "is no enemy but a mighty and wondrous incentive to religion." The mathematician Euler published *A Defence of Divine Revelation against the objections of Freethinkers* (1747). Haller, the physiologist and poet, thought that Nature and Newton proved the truth of religion:

¹⁸ *Spectator*, no. 543 (1712).

Enough! There is a God; of him we see some trace
Whenever steadily we look in Nature's face.

On the other hand there were many persons to whom the scientific method and world-view seemed to cast doubt upon all the principles of even natural religion. D'Alembert, in his *Treatise on Dynamics* (1743) showed that the laws of nature are necessary and universal, and added that though some drew from their simplicity an argument for the wisdom of the Creator,

we should abstain from this line of reasoning . . . for, the nature of the Supreme Being is too much hidden from us to enable us to know what is, or is not, agreeable to his views of wisdom.

Somewhat more boldly Diderot insinuated the principles of skepticism, oscillating between Deism and atheism. At one time he wrote a tract *On the Sufficiency of Natural Religion*; at other times he suggested that religion has been the source of many crimes, fanaticism, war, and persecution. If God really exists, he declared, he will not be devilish enough to punish us for doubting his existence.

A fiercer attack on religion was made by La Mettrie, the author of *L'Homme Machine* (1748). He examined many books proving the existence of God, and concluded that they are all wrong. He balanced arguments for and against the existence of God, in order to reach the final result that every man is obliged by his nature to be Christian, Deist, or atheist, or whatever he is, and will find arguments to support his belief. But he added that even if God exists he has given us no reason for worshiping him; that religion is hostile to science and useful only to politicians, and that it does not improve the morals of those who hold it.

The flat assertion of dogmatic atheism came in the writings of Baron d'Holbach. In his *Système de la Nature* (1770), Part II, he stated that the idea of God, like many other ideas, has no correspondence to any reality, but originates only "in ignorance, fear, and calamity." Primitive men, frightened by earthquakes, storms, and floods, and ig-

norant of the laws of nature, imagined unexplained calamities as due to the act of a mighty Being; these ideas of divinity are banished by science: a thunderstorm was explained as a bolt hurled by God until Franklin proved it to be a flash of electricity. Holbach refuted the proofs of God's existence given by Newton, Descartes, and others; he argued that moral notions are independent of religious support; and he defended atheism as compatible with morals, agreeable to reason, and harmless to society, even if propagated among the common people. In a popular satire called *Théologie portative, ou Dictionnaire abrégé de la religion chrétienne* (1776) he drove home his radical ideas with merciless ridicule of theological mysteries, myths, and morals. In this he defined the word "God" as

synonymous with "priest"; or, if one prefers, the factotum of the theologians, the first agent of the clergy. . . . The word of God is the word of the priests; the glory of God is the arrogance of the priests.

A *philosophe* who held to a "natural religion" practically tantamount to atheism and animated with a bitter hatred of Christianity, was Helvétius. In his treatise *On Man* (*De l'homme*), after pointing out that every man believes, on the authority of his nurse and of his tutor, that his own religion is true and all others false, the author proclaims that there is a truly universal creed founded in eternal and invariable principles and as demonstrable as a proposition in geometry. This religion consists principally in a belief in God, who says to man:

I have created you, and I have endowed you with five senses, with memory, and with reason. I wish you to use your reason to gain a livelihood. . . . I wish also that, by cultivating this reason, you should come to a knowledge of my universal, moral will; that is, to a knowledge of your duties to society, of the means of preserving order, and finally to a knowledge of the best government possible. That is the only religion I wish for men; the only one which can be universal and worthy of the dignity of God.¹⁷

¹⁷ *Œuvres*, iii, 71.

While thus reducing religion to simple morality, Helvétius points out that the spirit of all historical religions has been hostile to the spirit of the laws; and that of all historical religions, Roman Catholicism is the worst in this regard.

It was not only the atheists who saw clearly the fundamental repugnance of science to religion. Many Christians felt exactly the same way about it. The Pietist Francke declared that he could not make students of geometry good Christians. His colleague Lange called mathematics a false erudition leading to atheism. Wesley stopped the study of mathematics because he feared it would make him an atheist; and he rejected the Newtonian astronomy as dangerous to faith and as overthrown (so he imagined) by W. Jones of Nayland. Jonathan Edwards wrote:

To reject everything but what we can first see to be agreeable to our reason tends, by degrees, to bring everything relating not only to revealed religion, but even natural religion, in doubt.

Many Christians felt the danger to their religion in various discoveries that contradicted the Biblical accounts of creation, or other ideas embodied in the Bible. Linnæus's *System of Nature* was forbidden in the papal states by Clement XIII because it classified animals differently from the method adopted by Moses. The same scientist's description of sex in plants was branded as immoral by one J. C. Siegesbeck, because God would never have allowed the polygamy of some plants, nor the polyandry of others in which the pistil-wife has a harem of stamen-husbands.

As the Biblical account of the creation and early history of the world was seen to be contradicted by the new astronomy and geology, it was elaborately defended by William Whiston in a treatise called *A New Theory of the Earth . . . wherein its creation, deluge, and conflagration as laid down in Holy Scriptures are shown to be perfectly agreeable to Reason and Philosophy*.

The argument over the creation and deluge led to one of the most famous hoaxes in the annals of science. Beringer,

a professor of medicine at Würzburg, advanced the theory that fossils are not capable of being formed by any natural process, but are examples of the divine handiwork inserted in the rocks immediately by the Creator to confound infidels by proving to them his ability to form the likenesses of animals and plants. His ardent championship of this hypothesis suggested to some of his students a practical satire that ended in a farce and a tragedy. They manufactured, from clay, fossil-like objects with Hebrew and Syriac inscriptions purporting to have been stamped by God himself and attesting their divine origin. Incredible as it may seem, Professor Beringer accepted these gross counterfeits as genuine, hailed them as giving a welcome support to his hypothesis, and for long defended them against the doubts of skeptics. Only when the fraud had been acknowledged by its perpetrators did the professor abandon his convictions. While he died of chagrin, the reading public of Europe was convulsed with derisive mirth.

In the same year as that in which Beringer's attempt to vindicate the Bible collapsed (1726) there appeared a work with the same purpose as his by a somewhat less gullible student. Professor John Hutchinson, of Cambridge, in a treatise which he entitled *Moses' Principia* in order to oppose it to Newton's *Principia*, assailed the new astronomy and geology as tending to atheism, and tried to extract a complete system of natural science from the Bible.

As this attempt, too, met with failure, the conservatives turned to force to supply the defects of argument. On June 15, 1751, the Syndic of the Faculty of Theology at Paris wrote Buffon that some parts of his *Natural History* were not conformable to the teachings of religion, and therefore must be withdrawn by the author. They sent him fourteen propositions, culled from his works, which they condemned: these dealt with the age of the earth (which Buffon had placed at about 70,000 years, instead of the Biblical 6,000), with the formation of the earth by water, with the separation of the planets from the sun, with the probable cooling

of the sun, with the soul, and with the assertion that truth is derived only from science.¹⁸ The author, who had no ambition for the martyr's crown, replied submissively, and hastened to recant in these words:

I declare that I had no intention of contradicting the text of Scripture; that I believe most firmly all therein related about creation, both as to order of time and as to matter of fact. I abandon everything in my book respecting the formation of the earth, and generally all that may be contrary to the narrative of Moses.

A quarter of a century later, when he published *Epochs of Nature* (1778), Buffon anticipated the theologians by a long preliminary explanation showing how well his theory agrees with that of Genesis, provided only that one would give up the literal meaning of the text when it "appeared directly contrary to right reason and to the facts of nature." Though the Sorbonne found this condition insolent and worthy of animadversion, they were restrained from further action by the fame of Buffon and by the wishes of the king.

The case of Buffon, which the reader will compare with that of Galileo, was not the only example of the conflict of science and religious authority during the Enlightenment. Though the practice of inoculation was introduced largely through the efforts of the Mathers, and was sanctioned by Jonathan Edwards, it fell under the condemnation of some theologians who found it impious and sinful. The Sorbonne and other Catholic authorities condemned it on the ground that it caused the patient to remain away from mass and to eat meat on fast days. In a very violent attack on the practice, the Reverend Edward Massey, of England, denounced it as

a diabolical operation which usurps an authority founded neither in the laws of nature or religion, which tends to anticipate and banish Providence out of the world, and promotes the increase of vice and immorality.

¹⁸ *Œuvres de Buffon*, iii, 342.

Not less disturbing to the faith of many than was the growth of the scientific spirit, was the accumulation of new knowledge of other than Christian religions. Both the likenesses and the differences among the various cults confounded the apologists. Some nations lacked the ideas of God and immortality that they had asserted were universal; other nations had legends, miracles, and rites once claimed as the exclusive prerogative of authentic revelation. As early as 1690 Locke, a mighty champion of the faith, was obliged to abandon the argument for theism derived from the universal consent of mankind. Navigators, he admitted, had discovered whole nations in Africa and America without a notion of God, and travelers had described the literati, or ruling party of China, as all of them atheists. Bentley, in his lectures on the *Folly of Atheism*, was obliged to grant, on the authority of Champlain, that some Canadian tribes had no religion; this is the reason, he added, why they are so barbarous. The same line was taken by Steele, who attributed the savagery of the Hottentots to their atheism. Wesley found the American Indians godless, and therefore, "gluttons, drunkards, thieves, dissemblers, and liars." In France Louis Racine wrote a poem called *La Religion* (1742) to show that the accounts of atheistic savages prove nothing but that exceptions occur to the most universal rules.

The fundamental similarities and the great variety in the detail of all faiths were both explained by the first students of comparative religion too hastily as due to the pious frauds of priests and to the calculating policy of legislators. Earlier ages had referred the origin of false religions to the devil, who had sometimes copied and sometimes corrupted the true cult. In the eighteenth century the human impostor took the place of the devil. There is no more startling revelation of this almost universally held opinion than a casual remark of Casanova, a libertine and charlatan who made a good living by fraudulently abusing the credulity of the wealthy and weak-minded. At one place in his memoirs, after recounting how he had cheated his victims of money by pretending to tell fortunes and by other outrageous swin-

dles, he concludes with the remark that now he knows how religions were started and how their founders must have felt!

But the opinion, which he reduced to the absurd, was widely held. The Christian apologist Warburton represents the ancient mysteries as established by the state for the peace of civil society. Holbach, the atheist, declared:

If we go back to the beginning we shall always find that ignorance and fear have created the gods; fancy, enthusiasm, or deceit has adorned or disfigured them; weakness worships them; credulity keeps them alive; custom imposes regard for them; and tyranny supports them in order to use the blindness of men for its own ends.

The most elaborate exposition of this doctrine of the artificial creation of religions for secular purposes is found in the *Testament* of Jean Meslier published, twenty-nine years after the author's death, by Voltaire. Meslier was a French curate who was turned into a bitter enemy of religion by seeing it used, by unbelieving princes and prelates, as an instrument to oppress the poor. Not daring to print his thoughts openly, he left them to posterity in a manuscript, which he called his *Will*, or, more fully,

Thoughts and Sentiments on some of the abuses and errors in the guidance and government of men, by which the vanity and falsity of all the religions of the world are clearly and conclusively demonstrated.

The sufferings and oppression of men he believed due to the "detestable policy of those wishing to rule over their fellows unjustly, or else ambitious of a reputation for holiness or even for divinity." Religion is nothing but "abuse, error, illusion, falsehood and imposture, calculated to make human laws pass for divine laws." The miracles, the mysteries, the morals of Christianity are subjected to a withering analysis, and this is followed by an attack on theism and a profession of materialism.

Among the few minds able to see deeper into the origin of

religion than was Meslier, Charles de Brosses, historian and public man, deserves to be mentioned. His treatise on fetishism (*Du culte des dieux fétiches*, 1760) by comparing the ancient Egyptian religion with that of modern Africans, and by rejecting the far-fetched interpretation of the ancient mysteries then in vogue, laid the foundation of the anthropological approach to the study of the subject.

The most effective of all the critics of religion during the period of the Enlightenment was David Hume. After assimilating all that science, philosophy, and history could tell of this subject, his acute mind perceived, better than any other had done, the inconsistency of the apologists, the psychological causes of belief, the material factors governing religious revolution, the sophistry of the credulous, and the repugnance of faith to reason. His first essay on the subject, *Of Superstition and Enthusiasm* (1742) pointed out the predisposing conditions that give rise to these two corruptions of religion, both pernicious, but of opposite natures. The sources of superstition are weakness, fear, melancholy, and ignorance, and its effect is to fortify priestly and autocratic power. Enthusiasm, on the other hand, arises in hope, pride, presumption, and a warm imagination, and proves hostile to priestly authority and friendly to civil liberty.

The celebrated *Essay on Miracles* (1747) sums up with skill the whole case of the rationalists against supernaturalism. If, as the author avowed, the argument had been suggested to him by Archbishop Tillotson's attack on transubstantiation, that was not the only time when the controversies of the Christian sects were turned to their common confusion by the enemy of all of them. Hume begins by stating that a wise man proportions his belief in anything to the evidence for it; the more remarkable a fact the more evidence is required to prove it. Experience guides us in judging the probability of any given fact proved by testimony; sometimes it makes us too incredulous, as in the case of the Indian prince who gave a prize for the best lie he had ever heard to the northern traveler who asserted that water in his country sometimes became solid. A miracle is not

only a remarkable event, but a violation of the law of nature, which the whole experience of mankind, or at least the whole experience of each individual, has shown to be uniform. Therefore, Hume continues:

As a uniform experience amounts to a proof, there is here a full and direct proof, from the nature of the fact, against the existence of any miracle; nor can such proof be destroyed, or the miracle rendered credible, but by an opposite proof, which is superior.

Consequently no proof can establish a miracle unless the testimony be of such a kind that its falsehood would be more miraculous than the fact which it endeavors to establish. But there is not in all history any miracle attested by a sufficient number of men of such good sense, education, and learning as to secure them from delusion, and of such integrity as to put them beyond the suspicion of deceit. Presumption is raised against all miracles by the fact that some of them have been proved frauds, and by the fact that they always occur chiefly among barbarous nations and in uneducated circles.

Hume "flattered himself" that he had discovered an argument that would be "an everlasting check to all kinds of superstitious delusion"; and among these kinds of delusions he expressly rated the Christian faith which, he says, cannot be credited without miracles. His prophecy was more nearly fulfilled than such forecasts commonly are. In destroying belief in the supernatural Hume had sapped one of the fundamental bases of all religion.

Ten years after the appearance of the *Essay on Miracles*, the philosopher dealt another hard blow to the church in his *Natural History of Religion* (1757). His materials for investigating the origins of the various cults, though scanty, were sufficient to suggest a scientific view. Religion, he showed, has not been universal, still less uniform, but has taken many and strangely variant forms. Polytheism he thought the primitive form of religion, and the prevalent form until about 150 B.C., arising not in observation of nature, which is everywhere uniform and which thus suggests

monotheism, but in observation of the various and contrary vicissitudes of human life. The sun ripens crops which storms destroy; war favors one nation and harms another. These different fortunes men referred to the will of beings like themselves; hence arose allegory and euhemerism.

Monotheism, Hume continued, arose in the contemplation of nature. Even now, he remarked, the vulgar regard strange occurrences, like sudden deaths, hair-breadth escapes, and prodigies, as the best proofs of the existence of the Deity; whereas these apparent exceptions to general rules are the very things which the philosopher rejects in favor of arguments drawn from the uniformity and regularity of nature. Hence the history of all religions shows a constant oscillation between the two views, those of the learned and those of the vulgar. Polytheism he thought more tolerant but less morally strict than is monotheism.

All of Hume's arguments for complete skepticism are summed up in his *Dialogues concerning Natural Religion*, which he had thought out as early as 1750 and revised in 1761, but which were not published until 1779, three years after his death. The interlocutors are Cleanthes "the accurate philosopher," Demea, "inflexibly orthodox," and Philo "the careless skeptic." The personality and line of argument of each speaker is more particularly identifiable by the etymology of their names. Cleanthes, derived from the Greek words for "lock" and "flower," is John Locke, the flower of philosophy and the champion of the intellectual argument for the reasonableness of Christianity. Demea, from the Greek word meaning "common people," presents the ordinary opinions of the masses. Philo means "beloved," just as "David" does, and hence may be identified with Hume himself.¹⁹

Cleanthes advances the argument that "faith is a species of reason, and religion a branch of philosophy." In his

¹⁹ This is my own key to the dialogues; many other identifications have been proposed. For example, C. W. Hendel: *Studies in the Philosophy of Hume*, 1925, 315, says Cleanthes is Berkeley, Philo, Bacon, and Demea, Bayle or Malebranche. In my judgment this does not agree with the characters of the interlocutors, still less with their names.

opinion the argument for theism is as convincing as the argument for the Copernican astronomy. The world, as a great machine, and its parts, as smaller machines, prove that it and they were contrived by a great engineer with a mind somewhat similar to man. While Demea is scandalized even by this appeal to reason, Philo answers it by saying that the universe may as well be compared to an animal as to a machine, or that matter may contain in itself the principles of order. "What peculiar privilege," he inquires, "has this little agitation of the brain called thought, that we must make it the model of the whole universe?" In reply to the argument from science he says:

All the new discoveries in astronomy, which prove the immense grandeur and magnificence of the works of nature, are so many additional arguments for a Deity, according to the true system of theism: but, according to your hypothesis of experimental theism, they become so many objections, by removing the effect still farther from all resemblance to the effects of human art and contrivance.

How do we know, he continues, that the apparent order of our world is the effect of reason; innumerable worlds may have been botched and bungled through eternity before the perfect one of ours was produced.

In a final section Hume points out that all religious systems are subject to insuperable difficulties. Each disputant triumphs in turn while he exposes the absurdities, barbarities, and pernicious tenets of his antagonist; but all of them together prepare the triumph of the skeptic. In short, he concludes:

Examine the religious principles which have, in fact, prevailed in the world. You will scarcely be persuaded that they are anything but sick men's dreams: or perhaps will regard them more as the playsome whimsies of monkeys in human shape, than the serious, positive, dogmatical asseverations of a being who dignifies himself with the name of rational.

How far the principles of atheism or of skepticism penetrated the mind of the world is difficult to gauge. It some-

times seems as if the impact of reason on religion resembled the proverbial case of the irresistible force striking the immovable body. That some of the leading minds, and some of those who followed the prevailing fashion in opinion as in costume, became freethinkers, is certain. But the masses remained orthodox in the age of reason, as they have in all ages up to the present. This was partly due to their inability to think for themselves, partly to the careful protection of their minds from opinions considered dangerous by the authorities. That religion was the chief preservative of the morals of the masses was asserted by most political theorists, divines, and statesmen.

Throughout the period of the Enlightenment there were many complaints of the spread of infidelity. La Bruyère depicts an atheist as one of his famous *Characters* (1687). The word "freethinker," as a synonym for atheist began to gain vogue in the England of Anne. Collins said sarcastically that nobody had doubted the existence of God until the Boyle lectures undertook to prove it. Defoe explained the concurrent decline of superstition and rise of atheism in the much quoted lines:

But devils nor men the being of God denied,
Till men of late found out new ways to sin,
And turned the devil out to let the atheist in.

Turgot complained, in 1746: ²⁰

Incredulity grows more and more in Europe and daily acquires new proselytes who, soon transformed into apostles, spare nothing to accredit their opinions. They try to make that which has only too well germinated in the heart conquer the mind; they dogmatize orally in social circles; they flood the press with writings against religion.

In like manner Haller wrote in 1772: ²¹

Some men have conspired against religion again. They attack the heart with pretty but licentious pictures in order to prepare it

²⁰ *Œuvres*, i, 87.

²¹ *Briefwechsel zwischen Haller und Gemmingen*, 1899, 19.

to hate religion. A missionary of unbelief said to me that one generation must be sacrificed in order to convert the next—that is, to free it from religion. . . . This conspiracy seems more dangerous to me than that of Catiline.

When infidelity became the fashion in the gay world, it was aped by the hangers-on of the aristocracy and sometimes hypocritically affected even by ladies and gentlemen who were not really converts to it. Beaumarchais introduced into his play a lout who boasts that he is an atheist even if he is only a barber. Horace Walpole's acute observation was doubtless not much wrong when he wrote the poet Gray about the French:

You must not conclude their people of quality atheists—at least, not the men. Happily for them, poor souls! they are not capable of going so far into thinking . . . They are ashamed to defend the Roman Catholic religion, because it is quite exploded; but I am convinced they believe it in their hearts.

And yet, making every allowance for the exaggerations of the amount of skepticism by frightened prelates and by ardent free-thinkers, we cannot fail to see the enormous decline of faith and growth of all forms of dissent from the Christian creed during the age of reason. It was not only that very many thinkers of the first magnitude, and of lesser magnitudes, went over to the enemy, but that doubt and uncertainty tintured the thought of great bodies of Christians. Popular rationalism grew apace and gradually discredited one form of supernaturalism after another. The blows delivered to religion had repercussions not only on the churches but on politics, law, literature, and education. The marked change in the tone of thought was well summed up by Gibbon in the words:

In modern times latent and even involuntary skepticism adheres to the most pious dispositions. Their admission of supernatural truth is much less an active consent than a cold and passive acquiescence.²²

²² *Decline and Fall of the Roman Empire*, ii, 110.

CHAPTER XV

THE DECLINE OF SUPERSTITION AND OF PERSECUTION

I. SUPERSTITION

Though superstition still lingers in dark corners of our civilization, and though intolerance still makes dangerous opinion liable to social penalty, both of these ugly monsters have been reduced to relative insignificance in the course of the last two centuries. They were first vanquished by the eighteenth-century rationalists, here, as elsewhere, the enemies of all that is absurd, and of all that is cruel, in human institutions.

England led the way. There, even in the seventeenth century, the witch hunt rapidly declined to an unlamented end.¹ After the holocaust of 1645 the number of victims rapidly decreased. The last execution for this crime that has actually been traced is that of Alice Molland in 1684. After that there were very few indictments, and still fewer convictions. In 1701, when a man named Richard Hathaway accused an old woman of being a witch, she was acquitted and

¹ Since the first volume of this *History of Modern Culture* was written, a very important study of English witchcraft has appeared. C. L'Estrange Ewen: *Witch Hunting and Witch Trials: The Indictments for Witchcraft from the records of 1373 Assizes held for the Home Circuit A.D. 1559-1736*, London, 1929. Mr. Ewen has discovered five times as many indictments as were known to Notestein for the five counties he has investigated. Mr. Ewen also shows that earlier historians were all in error in assuming the period of the Commonwealth to be the worst. "So far as can be estimated from existing records," he says on page xii, "there were more trials during the forty-two years of Elizabeth than during the entire seventeenth century." The proportion of convictions was also much higher then; see p. 100. Mr. Ewen's conclusion that the total number of persons executed for witchcraft in England during the period 1558-1736 fell a little short of a thousand (p. 112) agrees exactly with my estimate, above, vol. i, 450.

he was remanded to jail until he could find sureties for his good behavior. In 1712 occurred the last conviction for witchcraft known in England. In that famous case the jury found Jane Wenham guilty of witchcraft, but the judge, Sir John Powell, who had ridiculed the testimony by remarking, when she was accused of flying through the air, that there was no law against flying, respited her and obtained a pardon. For this he was attacked by some clergymen who urged that the law be allowed to take its course. In 1717 an indictment for witchcraft was brought before the grand jury at Leicester, but the bill was not found and so the trial did not come on.

In 1736 the English and Scotch laws against witchcraft were repealed and it was further enacted that thereafter

no prosecution, suit, or proceeding, shall be commenced or carried on against any person or persons for witchcraft, sorcery, enchantment, or conjuration. . . . Be it further enacted . . . that if any person shall . . . pretend to exercise or use any kind of witchcraft, sorcery, enchantment, or conjuration, or undertake to tell fortunes . . . every person so offending . . . shall, for every such offense, suffer imprisonment by the space of one whole year.²

This law, like most others, lagged far behind public opinion which had been converted for the most part half a century before. While the skeptics led the attack, the clergy maintained a stubborn defense of this, as of other superstitions. Blount, the Deist, spoke with scorn of witches as fit only for Bedlam.³ But Richard Baxter, an old and famous Puritan divine, in 1691 published: *The Certainty of the Worlds of Spirits fully evinced by unquestionable Histories of Apparitions and Witchcrafts, Operating Voices, &c.* . . . written for the Conviction of Sadducees and Infidels. Recommending as the best authorities Bodin, Remy, the *Witches' Hammar*, the Mathers, and Glanvill, Baxter related as true and well attested many absurd stories of ghosts

² 9 Geo. ii, c. 5.

³ *Anima Mundi*, 1679, 51.

and of sorcery. The baleful book added fuel to the flame in New England.

In three pamphlets on *The Devil*, *The Black Art*, and *Apparitions*, Daniel Defoe investigated the history of the subject in a half-mocking spirit (1726-27). He finds it odd that Satan should discover frauds, detect murders, reveal secrets, tell where money is hidden, and tumble chairs and stools about houses, for,

suchlike mean, foolish things are beneath the dignity of the devil, who in my opinion is rather employed in setting the world with the bottom up, tumbling kings and crowns about, and dashing nations one against another.

Doubtless there were then many persons who, like Addison, "stood neuter in opinion, believing in general that there had been such a thing as witchcraft, but unable to give credit to any particular instance of it."

After another generation Middleton could declare, in his *Free Inquiry*, that though no miracle "is so authentically attested as the existence of witches," yet the "incredibility of the theory prevailed, and was found at length too strong for all this force of human testimony; so that belief in witches is now utterly extinct."

Perhaps the real state of public opinion is more truly reflected in *Tom Jones*, published in the same year (1748). Fielding depicted his parson as complaining that nobody any longer believes in the devil, and Partridge, the learned barber, as still crediting stories of witches, while Tom Jones, the young squire, smiles at the superstition of his friend as obsolete.

While Goldsmith's *Rules for Raising the Devil* ridiculed demonology, the lawyer Blackstone in his *Commentaries on the Laws of England* (1765) said:

To deny the possibility, nay, actual existence of witchcraft and sorcery, is at once flatly to contradict the revealed Word of God in various passages both of the Old and New Testament; and the thing itself is a truth to which every nation in the world hath in its turn borne testimony.

The lawyer found a powerful ally in the divine. John Wesley harbored this and other superstitions, and propagated them mightily in his sermons. He accepted, as true, accounts of poltergeist noises and of ghosts; he regarded natural phenomena as providential rewards or punishments; he thought physical or mental abnormality due to the direct action of God or of the devil; he cast lots or opened the Bible at random for guidance in doubtful decisions. A much-quoted passage in his *Journal* declared:

It is true that the English in general and most men of learning in Europe have given up all accounts of witches and apparitions as mere old wives' fables. I am sorry for it. . . . Infidels have hooted witchcraft out of the world. . . . They well know (whether Christians know it or not) that the giving up of witchcraft is in effect giving up the Bible.⁴

The fact that the devil rarely appeared in person any longer he explained as follows in one of his sermons: ⁵

It is an unquestionable truth that the god and prince of this world still possesses all who know not God. Only the manner wherein he possesses them now differs from that wherein he did it of old time. *Then* he frequently tormented their bodies as well as their souls, and that openly and without any disguise; *now* he torments their souls only (unless, in some rare cases) and that as covertly as possible. The reason of this difference is plain: it was then his aim to drive mankind into superstition; therefore he wrought as openly as he could. But it is his aim [now] to drive men into infidelity; therefore he works as privately as he can.

Wesley's credulity was fiercely satirized by many contemporaries. Hogarth, for example, in a cartoon representing *Credulity, Superstition, and Fanaticism*, depicted a Methodist preacher brandishing a toy witch in one hand and a toy devil in the other, while the congregation sing one of Whitefield's hymns, and a cherub waves a banner inscribed "To Saint Money."

Scotland, ridden by the kirk, harbored the dark superstition longer than did England. In 1678 ten women were

⁴ *Journal*, v, 375 (1768).

⁵ *Works*, v, 451 (c. 1750).

condemned to the flames on one day on the charge of having had carnal intercourse with the devil. A woman held to be a witch was put to death by a mob in 1705. In 1727 a woman was judicially burnt for sorcery. When the law against witchcraft was repealed in 1736, the Associated Presbytery solemnly protested it as an infraction of the express word of God.

In British America, outside of Connecticut and Massachusetts, only one woman was ever put to death for the crime of witchcraft; this was in Maryland. Belief in sorcery, though fairly common, was not strong enough in the other colonies to cause persecution unto death. Prosecutions, though sometimes brought, came to nothing. One Pennsylvania jury brought in the verdict "guilty of having the common fame of a witch," but would go no further. In 1730 a man and a woman, tried for witchcraft, were put to the common water test, and to the uncommon test of weighing them against a Bible. Though they outweighed the Bible, contrary to the expectations of their prosecutors, and though they floated in the water in a manner that would have condemned them before a superstitious court, they were both acquitted.

In the last decade of the seventeenth century in New England a violent persecution of witches took place, like the final spasm of a dreadful disease just before convalescence. The dying belief was rekindled by Increase Mather's *Illustrious Providences* (1684) in which he spoke of the "old heresy of the sensual Sadducees, denying the being of angels either good or evil," and continued: "How much this fond opinion has gotten ground in this debauched age is awfully observable; and what a dangerous stroke it gives to settle men in atheism is not hard to discern."

When the wood had been carefully piled by Mather, the fire was applied by a spark from Salem. The superstition of the local clergyman, the outlandish beliefs of an old Negro slave, and the excitable imagination of frightened children, led to wholesale accusations of enchantment that excited the colony to fever heat. In 1692 the English governor, Sir

William Phipps, issued a special commission of oyer and terminer to seven magistrates to hear cases. The trials, marked by unfairness, prejudice, and cruelty, ended in the hanging of nineteen persons as witches and in pressing one to death for refusal to plead. Scores of less severe punishments were also meted out. When the court adjourned, hundreds of accusations continued to be brought in, including one against the Rev. Samuel Willard, an influential clergyman, and one against the wife of the governor. Perhaps these charges brought the ruling class to their senses; perhaps the fever heat cooled of itself. At any rate when after an interval trials were resumed before the regular courts only three persons were convicted, and they were freely pardoned. Presently proceedings against all the accused were stopped and the jails were cleared.

The hanging of the Salem witches has attained a notoriety out of proportion to its relative importance. Compared to the holocausts of victims in Europe, the number executed in America, probably not more than thirty-five in all her history, is very small. After 1692 no person suffered death as a witch in the British American colonies, though in some parts of Europe executions continued long after this date. Moreover, Massachusetts, the worst and almost the only offender, had the grace to confess her fault and to repent, as no other country ever did. Thomas Brattle subjected the proceedings of the special court to a withering analysis. Judge Sewall, of this court, voluntarily confessed his error in church and asked pardon of God and man. The General Court of Massachusetts then appointed a day of fasting and humiliation to ask divine forgiveness for "the late tragedy raised amongst us by Satan and his instruments, by the awful judgment of God (1696)." Somewhat later money indemnities were granted to the families of the sufferers. Public indignation drove Parris, the Salem pastor chiefly active in the hunt, from his parish.

While almost everybody was turning from the abomination, it was still defended by one man, Increase Mather. In a work called *Wonders of the Invisible World*, this leading

divine offered "observations as well historical as theological upon the nature, the number, and the operations of the devils," gave an account of the late trials, and further arguments for belief in the reality of the crime. He wrote in fear, as one "expecting to be buffeted by devils for encountering them," and from a high sense of duty to "countermine the whole plot of the devil against New England." Both from the Bible and from many accounts of witches, apparitions, and ghosts, Mather argued for the reality of magic and sorcery.

The defense of the dying superstition did not long go unanswered. On January 12, 1696, Robert Calef wrote to the ministers of Boston denying the possibility of a covenant between witches and the devil, and continuing:

In the search after such sort of criminals, how many countries have fallen into such convulsions that neither the devastation made by a conquering enemy, nor the plague itself have been so formidable. . . . And hence they are fallen so far as to reckon it necessary to make use of those diabolical and bloody ways always heretofore practised for their discovery, as finding the rules given to detect other crimes are wholly useless for the discovery of such. This is that which hath produced such a deluge of blood mentioned, and must certainly do so again, the same belief remaining.

Four years later the same gentleman published *More Wonders of the Invisible World*, a mocking attack on Mather and his belief. Thoroughly rationalistic in spirit, he asked

whether witches have been the cause of our miseries, or whether a zeal governed by blindness and passion and led by precedent has not herein precipitated us into far greater wickedness than any yet proved against those who suffered.

With good reason he exposed the absurdity of Mather's accounts of devils walking in the streets as black men. The convulsions into which some people fell, and which they had explained as due to magic, he rightly attributed to imposture or distemper. After this very little was heard of sorcery in British North America.

On the continent of Europe the trials, the torture, and the executions lasted a century longer than they did in England. In the Teutonic North the two bright spots were Prussia and the Netherlands. In 1719 Anthony Collins reported, in his *Discourse on Freethinking*:

The devil is entirely banished from the United Provinces, where freethinking is in the greatest perfection; whereas all round about that commonwealth he appears in various shapes, sometimes in his own, and sometimes in the shape of an old black gentleman, sometimes in that of a dead man, sometimes in that of a cat.

In Germany the executions continued sporadically, though they fell off greatly in numbers. The last wholesale burning was that of 97 persons sentenced in 1679 by the Archbishop of Salzburg. After this the trials became fewer, but they did occasionally occur and end in capital punishment. One that excited the attention of all Europe was that of the high-born nun Maria Renata, the sub-prioress of the convent of Unter-Zell at Würzburg in 1749. The prosecution was led by her superior, Abbot Goschert, and the Jesuit Father Gaar, who harangued the mob in exposition of her crime and defended her execution in the literary controversy that followed it. Parts of the minutes of her trial (fifty or sixty folio pages), including her first confession signed twice with her autograph, are among the manuscripts of the Cornell University Library.⁶ Though the confession, of course, says nothing of constraint, it plainly implies, to the student of witch trials, that the poor woman at the age of sixty-nine was made to face the usual tortures. After this, there was a witch war in Bavaria during the decade 1766-76. Two witches were burnt at Glarus, Switzerland, in 1782, and two in Poland in 1793. This ended the ghastly series for civilized Europe.

In the meantime the great debate on the reality of magic and witchcraft continued before the bar of public opinion. In 1691 Balthasar Bekker, the Dutch Reformed pastor in

⁶ They were bought in 1899 by Andrew D. White from the estate of the Bamberg librarian, Dr. Friedrich Leitschuh.

Frisia, led the attack on superstition in a bulky work called *Betooverde Wereld* (*The Bewitched World*). The subtitle declares it to be "a thorough investigation of general superstition concerning the nature, power, might, and work of Satan and evil spirits . . . an investigation undertaken by natural reason and the Scripture." On the second of these two authorities Bekker laid by far the greater stress. Convinced that "those who have least understanding of the Bible have most of this superstition," he set out to free the Bible from responsibility for accrediting witchcraft, and to throw the guilt on Paganism and Catholicism. With great learning he examined the superstitions of the ancient world and of the heathen in Asia, Africa, and America. He then searched the Scriptures and the primitive Christian writings to show that they do not warrant the belief in the powers of the devils over men that had commonly been attributed to them; and he finally drew the conclusion that faith in magic is a corruption of pure religion taken over from the pagans, and preserved by the papists, a corruption which should have been, though it was not, cured by the Reformation.

While the rationalist could not have found Bekker's book, with its partisan and false conclusions derived from a partly correct apprehension of the facts, at all conclusive, the Christian felt its force and tendency. The author was accused of Sadduceeism and insolence and was unfrocked by the Synod of Alkmaar. The work excited so lively a controversy in the author's own and in other lands that 146 books attacking or defending it have been counted. Among these was the *Nemesis Romano-Austriaco-Tyrolensis* written by an Austrian jurist and professor at Innsbruck to stimulate the persecution and to defend the worse abuses employed in the trials. This was countered by several pamphlets and treatises, deprecating the use of torture and arguing against the superstition as a whole, written by Christian Thomasius.

In France one of the first to attack the noxious mania was Pierre Bayle. His *Reply to the Questions of a Provincial* (1704) praised the skepticism of Holland and Prussia and

attributed the belief in sorcery to a disordered imagination. Nevertheless, even he argued, as had Hobbes, that those who professed to have made a pact with the devil should be punished. In a little tract not published until 1916 Bayle satirized the whole superstition in the form of *An Oration of the Duke of Luxembourg to his Judges*. This pamphlet defended the duke from the charge of having made a pact with the devil in order to enable him to enjoy all the women he wanted, to win victories in war, and to get the royal favor, by alleging that it was unnecessary for him, in order to procure these ends, to pay so high a price as his soul. As to the first alleged reason for the pact, the defendant asserts that in France the women are all so obliging that he rather dreads than wishes for more mistresses than he has.

Voltaire, of course, declared war on this as on all other forms of superstition. In his *Philosophical Dictionary* he wrote:

Our courts of justice have rejected the belief in evil spirits, and witches are subjects of laughter; but Gaufredy and Grandier were both burnt for witchcraft, and lately, by a majority of voices, a monk was condemned to the stake by one of our Parlements for having bewitched a young damsel by breathing on her.

And again, in the same book:

Witchcrafts, divinations, and possessions were for a long time universally accounted the most certain things in the world. What numberless crowds have seen all those fine things! But at present such certainty begins to lose its credit.

On the other hand many priests and some jurists continued to defend the dying superstition. It would be superfluous to notice all these monuments of credulity. It is interesting, however, to pause a moment to consider a new argument brought to buttress the tottering faith. This was the universal consent of mankind, as evinced by the discovery of sorcery among savages. This argument was exploited for all it was worth by Louis Antoine Daugis in a *Treatise on Magic* published in 1732.

In Italy the old superstition continued little impaired, and even found new defenders. Casanova was taken to a witch at Venice, as a boy of eight, to be cured of the nose-bleed. This she did by stripping him naked and saying a charm. As a young man he saw a priest exorcize the devils from the clouds in order to lay a tempest, and when he mocked the priest he was mobbed as an atheist. In 1755, as a young man, he was imprisoned by the Inquisition at Venice on a charge of magic.

One of the strangest works on witchcraft ever produced was the *Demoniality* of Father Ludovico Maria Sinistrari (1622-1701), written towards the end of the seventeenth century but not published until 1876. Sinistrari was a Franciscan professor of philosophy at Pavia and a consultor to the Supreme Tribunal of the Most Holy Inquisition, who wrote a work on *Crimes and Punishments*. Led by this path into a study of the crime of witchcraft, he made a discovery so new and important that he compared it to the discovery of America and to the invention of the microscope. This new idea was that devils might beget children by sexual intercourse with women. The practically universal opinion had hitherto been that, though such unions occur, they are always barren. Sinistrari, however, gathered from folk lore and from "science," that the world is full of spirits filled with lusts like those of man and capable of having offspring. Among the eminent men begotten by such unions he named Alexander the Great, Plato, Merlin, and Luther.

Other superstitions besides those connected with witchcraft survived into the age of reason, though generally in a pale color. Among these the belief in astrology was one of the most successfully attacked. The great comet of the year 1680 struck astonishment and terror into the hearts of the many, but also gave occasion for a number of brilliant assaults on the obsolete faith in comets as portents of divine wrath and diabolical calamity. Pierre Bayle led the charge in his *Miscellaneous Thoughts on the Comet of 1680, wherein it is proved by many arguments, both philosophical and theological, that Comets are not presages of Evil* (1682).

Opening with a criticism of the historical evidence for the theory of comets as omens, he first exposed the cheats of astrologers and then resorted to science to show that events on earth could hardly be affected by heavenly bodies millions of miles away. He showed further that the years in which comets appeared have not been especially disastrous, and that comets are "ordinary works of nature which, without regard to the happiness or misery of mankind, are moved from one part of heaven to the other by the general laws of motion." Finally, he argued that respect for comets has promoted more idolatry than true piety; for the pagans have been moved by them to the worship of false gods oftener than Christians to the worship of the true Deity.

In certain other quarters similar assaults on credulity were forthcoming. Balthasar Bekker's first work was a skeptical *Examination of the Significance of Comets* (1683). At the same time Carlos de Sigüenza y Góngora, professor in the University of Mexico, issued a manifesto assuring the inhabitants of New Spain that comets do not portend the wrath of God. An attack on this thesis by Martín de la Torre led to a protracted controversy.

From this time forth belief in comets as portents rapidly declined. In 1711 Addison ridiculed the "superstitious folies that subject us to imaginary afflictions and additional sorrows." Though Cotton Mather had, in 1680, defended the thesis that comets are both natural occurrences and supernatural warnings, his son Increase in 1726 felt constrained to give up the double explanation in favor of the purely scientific one. When John Winthrop lectured on comets at Harvard in 1759 he devoted himself entirely to astronomy, and barely mentioned "the idle and superstitious fancies which in times of ignorance have prevailed concerning them."

As earthquakes were less understood and more obviously destructive than comets, they were longer regarded with religious awe. The earthquake at Lisbon (1755), in which 30,000 people perished, gave a fearful shock to the indifferent and to the pious. A much smaller earthquake, which

shook New England in the same year, caused the production of a broadside with the title *Earthquakes Improved*, and containing the words:

When God sends forth his thundering voice
And bids the earth to quake,
Let man attend the sovereign sound
And all the nations wake.

John Wesley defended this superstition as he did nearly every other one. In a sermon on *The Cause and Cure of Earthquakes* he declared that "sin is the moral cause of earthquakes, whatever their natural cause may be," and that "they are the effect of that curse which was brought upon the earth by the original transgression."

The belief in special providences was attacked by the same party and defended by the same party as were the other current superstitions. As early as 1693 the skeptic Blount declared that wars and plagues are not punishments for original sin, but that wars are caused by such natural sins as revenge and ambition, and plagues by natural corruption of the air.⁷

But the clergy took a very different view. Cotton Mather in his *Magnalia Christi* (1702), wrote:

The things to be esteemed memorable are especially all unusual accidents in the heaven or earth or water, all wonderful deliverances of the distressed, mercies to the godly, judgments on the wicked . . . with apparitions, possessions, enchantments, and all extraordinary things wherein the existence and agency of an invisible world is more sensibly demonstrated.

The Canadian Catholics were as convinced as the New England Protestants that they were the special objects of God's care. When an English fleet sent against them in 1711 suffered shipwreck, a Canadian monk ascribed what he called "the greatest miracle since Moses" to the prayers of the saintly Jeanne Le Ber.

Carl Linnæus, too, though a scientist, drew up for the

⁷ *Oracles of Reason*, 12.

edification of his son a list of special providences and supernatural punishments for sin, which he entitled *Nemesis Divina*.

But such views were no longer held by the majority of scientists, nor even by all the clergy. Dean Swift, in a satire on "enthusiasm" called *The Operation of the Spirit*, said:

It is a sketch of human vanity for every individual to imagine the whole universe interested in his meanest concern [as, for example] if he got cleanly over a kennel, some angel unseen descended to help him by the hand; if he has knocked his head against a post, it was the devil for his sins let loose from hell on purpose to buffet him.

One of the last superstitions to disappear, if it has yet disappeared, was the belief in apparitions, either of the devil, or of some other spirit, or of the ghosts of the departed. Defoe, who dealt with the subject in a curious tract on *The History and Reality of Apparitions*, and who played upon public credulity in this regard in one of his most famous fictions, the *True Relation of the Apparition of one Mrs. Veal*, yet bore witness to the decline of faith in Robinson Crusoe, who declared:

I have often heard people of good judgment say, that all the stir people make in the world about ghosts and apparitions is owing to the strength of the imagination, and the powerful operation of fancy in their minds; that there is no such thing as a spirit appearing or a ghost walking.

A few years after Defoe wrote, Fielding made Parson Adams confess that though he is not afraid of ghosts, he does not absolutely disbelieve in them. Somewhat similar to the belief in ghosts was the faith in second sight. Pepys at the beginning of the period, and Boswell near its end, though each had outlived other superstitions, were very nearly convinced of the reality of the power of certain people to foretell the future by the aid of this miraculous gift.

Nothing is more difficult to assess than the exact bound-

aries between credulity and skepticism at any given period. At first glance the picture of the eighteenth-century mind in literature and in the laws looks extremely bright. The leaders of the best thought, and the writers now most read, were skeptical of the devil, if not of God. The Deists, the Encyclopedists, the scientists, the rationalists, the philosophers, the jurists, the essayists, almost unanimously decried the prevalent demonology and magic. The clergy were frequently, but not invariably, defenders of the faith in the powers of hell, and champions of the devil, as they were of God. Moreover the gradual dying away of the witch mania and its attendant horrors, and the cessation of such practices as the royal touch for the cure of scrofula, give a strong impression of growing enlightenment.

But the more deeply one delves into the cultural history of the age, the more fully one is convinced how much this brightly lighted picture must be shaded. Beliefs officially and publicly renounced were harbored in secret. Not only among the ignorant masses, but in the circles of the most exclusive society, crude and horrible ideas and practices survived. A vast twilight zone of half-belief covered large sections of society. Sorcery survived in milder forms than those earlier visited with death and torture. The masses still clung to the old mythology of the devil, of comets, and of ghosts. When the wife of a man fell sick, or when his son was dropped from the university, the man still commonly attributed the misfortune to the devil or to the stars.⁸ Now and then epidemics of religious hysteria broke out, such as the Wesleyan and Edwardsian revivals, or the mania in France in 1727, in which wild disorders were committed around the grave of a miracle-working deacon. When the plague broke out at Moscow in 1771, the efforts of the government to enforce sanitary precautions and to remove the image of the Virgin to which crowds resorted and thus spread the infection, were met with savage rioting culminating in the lynching of the archbishop.

Moreover, the eighteenth century continued to produce

⁸ See Holberg's comedy: *Erasmus Montanus*.

many works on magic, now no longer read, but once devoured by large numbers of the credulous. The sylphs and salamanders, that meet us so playfully in the drawing-room of Pope, were the objects of a serious mythology in the works of a whole school of Rosicrucians and Cabbalists. One of the strangest features of this new efflorescence of magic is the endeavor to connect it with science. Practices that can be traced back to the Faust-book and to Cornelius Agrippa, beliefs descended from early Gnostic works and from the literature of Simon Magus, were given a new lease of life by adopting the terminology of the Newtonian physics and of the chemistry of Boyle. The apologetics developed by magicians in defense of the devil form a curious parody of the Christian apologetics evolved to find new reasons for belief in God and the Bible. Such books as the Abbé de Vallemont's *Dissertation sur les maléfices et les sorciers, selon les principes de la théologie et de la physique* (1752) try to harmonize the old and the new "truths." Others, like F. Maurer's *Amphitheatrum Magiæ universæ* (1714) distinguish nicely between divine magic, demonic magic, natural magic, and various other sorts. Such books were not only numerous, but were just as insane and just as gruesome as those produced in the heyday of demonology. One alchemist gave a recipe for making gold which directed procuring a baby born of the union of two pure virgins under an auspicious star, and then "calcinating" it, that is, burning it to ashes. Let us hope this prescription remained purely theoretical.

In certain circles magic was the fashion. Some people of the highest rank like the Duke of Orléans tried to raise the devil in a literal as well as in a metaphorical sense, and consulted wizards of all sorts to help them. Paris, said Montesquieu, swarmed with impostors, some of whom would tell you how to make vast quantities of gold in return for a small fee, and others who would offer you pleasure with beautiful aërial spirits, provided you were a virgin and thirty years old. Charlatans played upon the public credulity with the more impunity because of the relaxation of the laws

against witchcraft. Such was the Paduan necromancer known to Peregrine Pickle in Smollett's novel, and such was the native fortune-teller, Cadwallader, in the same romance. Such in real life was the Comte de Saint-Germain, who passed his evenings at the court of Louis XV telling the gaping courtiers that he had lived so long that he had known Saint Anne and the Virgin Mary, and had kept himself young by a magic drug. Such was Casanova, known chiefly to posterity by reason of his voluminous diary recording with almost unexampled nakedness the story of his innumerable amours. In addition to being a sexual libertine, however, he was also a duelist, a gambler, a sharper, and an impostor who told fortunes and offered recipes for making gold. One of his dupes at the French court was a Mme. d'Urfé, a woman equally interested in science, in magic, in her laboratory, and in the books of Paracelsus and of Raimon Lull.

All forms of divination were practised, so many, in fact, that it would take several lines merely to name them all. The favorite method of foretelling the future was still by the stars; and this form, surviving in the almanacs and in the casting of horoscopes, incurred the most ridicule from the skeptics. Congreve brought on the stage, in *Love for Love*, an astrological physician named Foresite, described as "an illiterate old fellow, peevish and passive, superstitious and pretending to understand astrology, palmistry, physiognomy, omens, dreams, &c." Congreve's commentator, Dr. Johnson, assures us that the character of Foresite was then a common one.

The almanacs that pretended to foretell the future were ridiculed by Swift in his famous squib, entitled *Prediction for the year 1708, by Isaac Bickerstaff, Esq.* In this he foretold the death of Partridge, the most notorious of the almanac-makers, on the twenty-ninth of March next. He followed this with a letter from a "person of quality" describing the death of Partridge very near the time predicted. This was pure fiction; for the wretched astrologer still lived, and was obliged to devote the rest of his life to strenuous,

but not wholly successful, efforts to prove to the public that the story of his death was false. The ludicrous controversy between Swift assuring the public that Partridge was dead, and Partridge swearing that he was alive, dissolved much of the current superstition in laughter.

In similar vein Ben Franklin, in the preface to *Poor Richard* for the year 1751, derided astrology as

now dwindled into contempt. The great [he makes his astrologer complain] neglect us; empires make leagues and parliaments laws without advising with us; and scarce any other use is made of our learned labors than to find the best time of cutting corns or gelding pigs.

This testimony to growing skepticism may well close the story of superstition during the age of the Enlightenment. Having warned the reader not to overestimate the triumph of reason in the eighteenth century, I must also caution him not to underestimate it. The powers of darkness had escaped annihilation, but they had suffered a decisive defeat. The devil seldom appeared, any more, in his full panoply of horror, except in Little Bethel and in the First Church of Northampton. He and his army of spirits still skulked in the backward parts of the world, in lonely country houses or in the chambers of the inquisitors or in the alchemical laboratories of the idle and uneducated rich. Some people still saw ghosts, or studied formulas for making gold, or tried to read their future in the stars, or in cards, or in the Bible. Witches still drove their gruesome trade and suffered gruesome punishments now and then. And yet, a vast change in public opinion had taken place. The sun had pierced the clouds, but not wholly dispelled them. The revolution was enormous even though it was not quite complete; and the gain for humanity was untold.

2. PERSECUTION AND TOLERANCE

As in political, so in religious freedom, England, during the seventeenth and eighteenth centuries, led the van of civ-

ilization. The first step towards a general toleration of all Christian churches was taken by James II not with a large ethical purpose, but merely with the desire to secure for his fellow Catholics relief from oppression. In 1687 he issued a Declaration of Indulgence, expounding the principle that conscience ought not to be constrained, promising to protect the Church of England, and suspending all penal laws and religious tests against non-conformists and recusants. Though he courted and won the support of a few Dissenters in this illegal use of the royal prerogative, he failed to conciliate the majority of them, who apparently preferred to be persecuted by law rather than to be set free by a despot.

These scrupulous sectarians therefore supported the Revolution on the understanding that they would be rewarded with a larger freedom of worship than they had hitherto constitutionally enjoyed. William III, with broader ideas of religious freedom than those accepted by Parliament, endeavored to unite all his Protestant subjects in a Comprehension Act relaxing subscription to the Thirty-nine Articles. When this bill, attacked on all sides, failed to pass, for it was substituted the Toleration Act (1689) which, though sometimes described as a great charter of religious liberty, was really a limited indulgence. Without repealing the persecuting acts on the statute book, this law merely provided that they should not be enforced against persons taking the oaths of allegiance and supremacy and making a declaration against transubstantiation. Ministers of religion were still obliged to sign the articles of the Church of England, with a few exceptions. The Baptist was allowed to leave unsigned the articles on infant baptism; and the Quaker was allowed to affirm instead of swearing. But the act expressly excluded from toleration Papists and Unitarians. Though illogical, this law gave a wider measure of religious freedom than had yet been allowed in England; and the practice of the government for a time neglected to enforce any of the persecuting laws against Catholics and Protestant Dissenters, except that which excluded both from

office, and that which compelled the Catholic to pay a double land-tax.

But though the Anglican Church was by this time willing to refrain from persecuting her Protestant brethren, she stiffly maintained her social and political monopoly—the latter only slightly infringed by the practice of “occasional conformity,” that is, the admission of a Dissenter to office on his receiving the communion according to the rite of the Establishment. Fresh persecuting acts, limited in scope and laxly enforced, were passed from time to time; no general relief was given until 1778.

Together with the extension of legal toleration, public opinion was educated to a larger indulgence of heterodoxy. The demand for greater liberty came most urgently from those who needed it most, the adherents of extreme sects, the Deists, and the scrupulous atheists. As early as 1684 Tindal demanded toleration of all religious opinion except atheism. In 1693, C. Gildon, the editor of Blount’s *Oracles of Reason*, wrote in the Preface:

Those who infringe Reason’s liberty . . . are justly looked upon as the enemies of human kind. . . . I must tell these fiery bigots that their practice [of persecution] and their doctrine [that every man must be saved by his own and not by another’s faith] being so contradictory, gives a more effectual blow at religion than all the attempts of professed atheists.

A weighty plea for tolerance issued from the pen of John Locke, in this as in other matters the apologist of the principles of 1689. His Latin *Epistola de Tolerantia* (1666), having attracted some attention, was expanded in the year of the Revolution into three long *Letters on Toleration*. The author’s purpose is set forth in the preface to the first letter in these words:

We have need of more generous remedies than what we have yet made use of in our distemper. It is neither declarations of indulgence, nor acts of comprehension, such as have yet been practised or projected amongst us, that can do the work. The first will but palliate, the second increase our evil. Absolute liberty,

just and true liberty, equal and impartial liberty, is the thing that we stand in need of.

In the body of his tract the author argued that mutual toleration by Christians of their several professions is the characteristic mark of the true church; love being the first commandment, those who persecute, torture, and kill men on pretense of faith, violate this primal law. Moreover, he continued, the business of the commonwealth is not religion, but the procuring, preserving, and advancing men's civil interests only. On the other hand, a church is a voluntary society, with no lawful powers to punish except by expulsion. But this principle does not entail connivance at crime committed, or permission to conspire against the state, under pretext of religion. Those, therefore, who practise immoral rites, or who plot harm to society, should be repressed. The corollaries of this principle are that neither papists nor atheists should be tolerated, for the former make their members subjects of a foreign prince, and the latter cannot be bound "by oaths, covenants, and promises, which are the bonds of civil society."

The next notable attempt to plead for wider religious liberty proved nearly fatal both to the cause it advocated and to the person of the author. In a famous tract, *The Shortest Way with Dissenters* (1702), Daniel Defoe parodied the violence of the high-church zealots with the intention of discrediting their arguments. In this he ironically urged the suppression of Dissent at all costs, for "though it is cruelty to kill a toad or a snake in cold blood, yet the poison of their natures makes it charity to our neighbors to destroy these creatures." The author's irony was at first taken for earnest; when it was discovered he was pilloried.

The progress of the better opinion may be gauged by two articles in the *Spectator* in 1711 and 1712. In the first Addison warned his readers that the first murder was occasioned by a religious controversy, and that one should be very careful not to imitate Cain's example. In the second article an unnamed author declared:

Of all the monstrous passions and opinions which have crept into the world, there is none so wonderful as that those who profess the common name of Christian should pursue each other with rancor and hatred for differences in their way of following the example of their Saviour.

Among those who argued for wider liberty of conscience, Benjamin Hoadly, Bishop of Bangor, attracted the most attention. In Latitudinarian tracts he denied the apostolic succession, made sincerity the only test of a Christian, and advocated the abolition of all temporal rewards or punishments for speculative opinion. For these arguments he was censured by the Lower House of Convocation. When, for this act of intolerance, and others, Convocation was prorogued and given no license to do business for more than a century, one great seed-plot of bigotry passed away.

Public opinion, both of the free-thinking and of the better Christian element, approved this act. Pope, nominally Catholic and really Deist, put into his *Universal Prayer* the following plea:

Let not this weak, unknowing hand
Presume Thy bolts to throw,
Or deal damnation round the land,
On each I judge Thy foe.

Even the less liberal divines were now prepared to renounce the coarse weapons of coercion. In his large apology, *The Divine Legation of Moses* (1739) Bishop Warburton praised the full toleration of the ancient law-givers; and in a tract on *The Alliance of State and Church* he freely adopted Locke's theory of the state as concerned only with the temporal well-being of its citizens and unqualified to deal with religious errors except when they produce grave "civil mischiefs." But, under this exception, he argued that the state should require belief in God, in his superintending providence, and in the moral law; for he held these three articles "the very foundation and bond of civil society."

While persecution for heresy was no longer avowed, the

repression of blasphemy was considered necessary. Bishop Berkeley, in his *Alciphron*, disclaimed persecution for opinion, but approved "some care taken to restrain petulant speech . . . and to discourage an outward contempt of what the public esteemeth sacred." The government continued to burn books and to pillory writers deemed offensive to the common faith. As late as 1762 Peter Annet was sentenced, for scurrilous attacks on Christianity, to stand twice in the pillory and to imprisonment at hard labor for one year.

So deeply was public opinion shocked by Annet's infidelity that his punishment occasioned one of the last expressions, by eminent authority, of thorough approval of the principle of persecution. In 1763 Dr. Johnson declared:

False doctrine should be checked on its first appearance; the civil power should unite with the church in punishing those who dared to attack the established religion.

So consistent was the bigoted doctor in this opinion that he defended the Roman Inquisition for persecuting Protestants, and the Roman emperors for persecuting the early Christians. "The only method by which religious truth can be established is by martyrdom," he averred.

While the lot of the English Jew and Catholic remained hard, that of the Protestant Dissenter became easier year by year. The purpose of the Test Act, to exclude Protestant Dissenters from public office, was nullified by a series of Indemnity Acts, passed almost every year from 1727 to 1828, relieving them of the necessity of taking the Anglican sacrament. Towards the end of the period here under consideration, a strong movement was launched for abolishing the requirement for many classes of persons to subscribe to the Thirty-nine Articles. A bill for relieving Dissenters of this obligation, in order to hold public or university positions, was carried in the House of Commons in 1772 and again in 1773; but was defeated in the Lords whenever put to vote, until 1779, when it was finally carried.

As in earlier centuries, so in the eighteenth, the Irish

Catholics bore the brunt of English intolerance. In 1695 the Irish Parliament, which represented only the Protestant minority of British colonists, passed laws prohibiting Catholic parents from sending their children abroad to be educated at any Catholic seminary, disqualifying papists from teaching school, rendering it penal for any Catholic, except a privileged few, to carry arms or to own a horse worth more than £5, and limiting the number of holy days to those recognized by the Irish Protestant church. Still more terrible laws followed in the reigns of William and Mary, of Anne, and of George I. By these, Catholic priests were made liable, for celebrating mass, to perpetual imprisonment, and all Catholics were excluded from all public offices, from the bench, from the bar, from the franchise, and from the army and navy. Other laws made the property of the Papist insecure by awarding the estate of a Catholic father to his apostate son; and still other laws banished all priests except those who would take an oath repugnant to their conscience.

By the middle of the eighteenth century the position of the Irish Catholics improved much in fact if not in law. When the skeptical Lord Chesterfield was made Viceroy (1744) he refused to interfere with their worship, and generally to enforce the persecuting laws. In 1759 a Catholic Association was formed to create a sentiment in favor of toleration. Several of the worst laws were repealed in the seventies, though even the great general bill for the relief of the Romanist Irish was far from putting them on a political and social equality with their Protestant neighbors.

Scotland, dominated by her clergy, lagged somewhat behind England in relaxing persecution. The Estates of Parliament in 1687 neglected the demand of James for the repeal of the penal laws. Ten years later a particularly atrocious case of persecution occurred when Thomas Aikenside, a youth of eighteen, was executed for the enunciation of skeptical opinions which he was ready and anxious to recant.

Religious liberty broadened and spread throughout the

British American colonies in the late seventeenth and in the eighteenth century. True to the splendid tradition of her founder, Rhode Island remained the freest state in the world. Educated by her example, influenced by the spirit of the times, and sometimes under the pressure of English laws, the more backward colonies approached nearer and nearer to the ideal of perfect tolerance. Nowhere in the world was the sectarian spirit so powerful and, in this respect, more beneficent. Narrow as was the theology and small as was the charity of each particular sect, the large numbers of churches, and the consequent weakness of each, made persecution difficult. Moreover the abounding prosperity of the colonists turned their thoughts into secular channels and away from exclusive preoccupation with dogma.

A general step in advance was taken when the English Toleration Act was declared by some of the colonial legislatures to be in force, and was assumed to be so by the public in other places. The new charter granted to Massachusetts by William and Mary in 1691, expressly provided:

For the greater ease and encouragement of our loving subjects inhabiting our said Province . . . we do ordain that forever hereafter there shall be liberty of conscience allowed in the worship of God to all Christians except papists.

This charter marks the change from an essentially religious to an essentially political and commercial New England.

Public opinion seconded the increased liberalism of the laws. As early as 1676 Peter Folger of Nantucket published a poem called *A Looking-glass for the Times*, saying that the sin for which God was then punishing New England by an Indian war was the sin of persecution. Cotton Mather himself in his *Magnalia* denounced the persecution of the Quakers. By the end of the seventeenth century there were nine Baptist churches in New England, and a Baptist had become President of Harvard. The worst outbreak of the persecuting spirit in eighteenth-century New England was directed against the extravagances of the revivalist preach-

ers of the Great Awakening. In 1742 the Connecticut legislature passed severe laws condemning such Dissenting ministers to fine and imprisonment. However, some even of the orthodox clergy protested against these laws as confounding the civil and ecclesiastical jurisdictions. In fact, they were enforced only for a short time; and they were the last persecuting laws passed in British America.

The Middle Colonies became at least as free as those to the North. The royal governors of New York, long before the Revolution of 1689, forbade any citizens to "disquiet others in the free exercise of their religion." The granter of the Pennsylvania Charter of Privileges of 1701 proclaimed the right of religious liberty in these words:

Because no people can be truly happy, though under the greatest enjoyment of civil liberties, if abridged in the freedom of their consciences as to their religious professions and worship, and Almighty God being the only Lord of conscience . . . I do hereby grant and declare that no person or persons inhabiting in this province or territories, who shall confess and acknowledge one Almighty God . . . and profess themselves obliged to live quietly under civil government, shall be in any case molested or prejudiced in his or their person or estate because of his or their conscientious persuasion or practice, nor be compelled to maintain or frequent any religious worship, place, or ministry, contrary to his or their mind.

In Pennsylvania, however, and in some other colonies, only Christians were allowed to hold public office. In 1691 the Catholics of Maryland were disfranchised; and in 1704 the Dissenters of South Carolina were deprived of political rights.

A severe test of British American liberalism was provided by the Quebec Act of 1774, by which the imperial government practically established the Catholic religion in French Canada, but allowed tolerance of Protestants. The Continental Congress, then meeting to resist British oppression, took a decidedly ambiguous position in respect to this act, when, under the stress of political exigencies, its members

issued two papers, of contradictory tenor, intended to appeal to two different publics. In an appeal to English anti-Catholic prejudice, the Congress spoke of the Quebec Act as establishing "a religion which has deluged your island with blood, and dispersed impiety, bigotry, persecution, murder, and rebellion through every part of the world." On the other hand, the Congress, in an address urging the French Canadians to join the rebellion, declared that difference of religion should be no barrier to political union, and pointed to the Swiss Confederation for proof. Doubtless each of these papers truly represented the sentiments of some Americans at the time; but the latter and more tolerant opinion was the prevalent one.

The contrast between governmental persecution and an insistent demand for religious liberty on the part of the radicals was sharper in France than it was in the English-speaking world. This was because the French persecution of Protestants was even harsher than the British persecution of Catholics, and because the French Deists were more logical than the British and American apostles of tolerance.

If Louis XIV fondly hoped that the religious question would be solved once for all by the revocation of the Edict of Nantes (1685) he was bitterly deceived. The Huguenots gave him more trouble after the revocation than they had done before. Fearing the material losses threatened by the emigration of large bodies of his most thrifty and industrious subjects, Louis at first forbade it, except to ministers, then hesitated and allowed it, in some cases, to laymen, and then again forbade it under stringent penalties. Under the stress of the fearful ordeal some Protestants recanted in explicit terms; some were allowed to make declarations in ambiguous terms held by them to be non-committal and by the rulers to be recantations; most refused to make any terms with their enemies and suffered the consequences in silent heroism. When missionary efforts failed to convert many, rigor was resorted to, and the horrors of the dragonnades began again. While the soldiers quartered on the hapless Huguenots were forbidden to kill or to rape,

they were allowed and encouraged to exert pressure by all means short of these extreme ones. They beat the men, tossed them in blankets, pulled out their hair, filled their houses with smoke, distended their bellies with water, kept them awake with maddening noises, and hung them up by the nose or by the toes; they stripped the women naked and otherwise outraged their modesty.

Even under this pressure the Huguenots for the most part remained steadfast, and often rose to a state of exaltation, seeing visions, hearing the voice of God, encouraging each other to endure martyrdom, and sometimes to resist by insurrection. After seven years of applying the tortures just described, the government recognized their futility, and relaxed them. Again in 1699 rigor gave place to mildness when a decree was issued saying that as the turning of hearts was in the hands of the Most High, no constraint should hereafter be used to make the New Catholics (as the forced converts were called) attend the mass. Nevertheless, a prolonged and dangerous rebellion ensued, in which, for eight years (1702-10) the Huguenots of the Cévennes sustained a guerilla warfare against the armies of France. In practice, thereafter, they were not molested except in a few sporadic cases, during the reign of Louis the Great.

The first act of Louis XV was to issue a declaration that the project nearest his heart was the extinction of heresy. In 1724 a new law forbade conventicles, banished the relapsed, and excluded Protestants from public office. This comparatively mild measure was followed by a savage edict in 1732, which again revived the old methods of death, torture, and the galleys. But, though the clergy egged on the populace and urged the officials to execute this law rigorously it was laxly enforced because of the growing repugnance to such cruelty on the part of the more enlightened lay public. So far did the connivance at Protestant meetings go that in 1744 the Huguenots dared to celebrate a national synod.

The more religious persons on both sides of the conflict were eager to take advantage of toleration for their own

parties, while retaining the right to persecute their enemies when they had the power to do so. The Faculty of Theology of the University of Paris in censuring Marmontel's tract in favor of toleration, entitled *Bélisaire* (1767), declared:

The prince has received the temporal sword in order to repress such doctrines as materialism, atheism, and Deism, which cut the bonds of society and instigate crime, and also to crush every teaching threatening to shake the foundations of the Catholic faith.

While thus defending their right to persecute Protestants, the Catholics eagerly welcomed such toleration as they could get in Protestant lands. In 1693 Bossuet approved the intention of the English Pretender, whom he still called King James, to recommend to Parliament, should he be restored to the throne, such general liberty of conscience as would give repose to his Catholic subjects. If, said the bishop, there are Catholics unwilling to share toleration with heretics, they should learn to obey the injunction of Ecclesiastes VII, 16: "Be not righteous overmuch; neither make thyself overwise; why shouldst thou destroy thyself?"

As Bossuet heartily seconded the persecution of French heretics, his position amounted to the fallacy: "I have the right to persecute you because I am right and you are wrong; but you have no right to persecute me, for the same reason." This was exactly the principle, though applied in the opposite sense, of the French Huguenot apologists. It is curious and tragic to see Pierre Jurieu, the ablest of the Huguenot exiles, alternately defend the right of the individual conscience, against Bossuet, and the right of the government to prescribe opinion and enforce orthodoxy, against Bayle.

Pierre Bayle was, in fact, the leader of the only party that stood for consistent tolerance of all religions, the party of the freethinkers. When his brother suffered martyrdom as a Huguenot in France, Bayle wrote a powerful denunciation of the bigotry of the government under the title *Ce que*

c'est la France tout Catholique sous le règne de Louis le Grand. At the same time he published, disguised as a translation from "the English of John Fox" his brilliant and original apology for freedom of conscience entitled: *Commentaire philosophique sur ces paroles de Jésus Christ, Contrains-les d'entrer.* He condemned the treatment of the Huguenots by urging that the havoc wrought by the persecutors gave rise to irreligion, by showing that belief can only be established by argument and persuasion, and by maintaining that literal compulsion is contrary to the spirit of the Gospel. On large philosophical grounds he objected to persecution as founded on an alleged certainty of truth such as no man can really possess. He concluded by demanding toleration not only of all Christian sects but of Jews, Mohammedans, and blasphemers.

By solid argument and by sly satire other writers were now about to take up the cudgels for free worship. The Marquis of Saint-Evrémond (1610-1703) who spent most of his life as an exile in England, wrote a tract to prove that one could not believe what one chose. Barbeyrac tried to show that the fathers of the church were in favor of tolerance. The popular novelist Le Sage, in a story called *The Devil upon Two Sticks*, dared mildly to ridicule both superstition and the Inquisition. In this he told how the servant of an inn-keeper masqueraded as a ghost in order to frighten his master into allowing him, in his character of servant, to marry the old man's daughter. When the master, after the marriage, discovered the hoax, he applied to the Inquisition to annul the marriage; "and the Holy Office," demurely adds Le Sage, "being informed that the parties were rich, thought fit to take cognizance of the case." While this case has nothing to do with toleration, it illustrates the charge often brought against the Inquisitors that they were frequently moved by mercenary considerations.

Among the *philosophes* Montesquieu was far from demanding general toleration of all religions. In his opinion the government of any state should tolerate those cults, and those cults only, that had a prescriptive right to the exercise

of their worship. Nevertheless, he condemned the excesses of the Spanish Inquisition; and, in his *Esprit des Lois*, he put into the mouth of a Jew a humble remonstrance against the auto-da-fé as repugnant to human dignity and public interest.

The Encyclopedists, of course, advocated the cause of tolerance as far as they dared. In the article "Gomaristes," the Abbé Morellet censured the civil powers for trying to impose faith; and in another article Denis de Sales calculated, with great precision, that fanaticism had caused 33,095,290 persons to perish.

An exalted plea for religious liberty was uttered by Turgot in a tract, published at Rome in 1754, under a title meaning: *The Conciliator, or Letters of an ecclesiastic to a magistrate on the right of citizens to enjoy civil tolerance for their religious opinions, on the right of the clergy to resist with the whole power of the church errors of which they disapprove, and on the duty of the prince in both cases*. Maintaining that "when kings interfere in matters of religion they do not protect it, they enslave it," he asks, "what protection ought the state to give the dominant religion?", and answered:

No religion has the right to demand any other protection but liberty; and it loses this right to liberty when its doctrines or worship are repugnant to the interest of the state.

Rousseau pleaded for a measure of religious freedom in a series of *Letters written from the Mountain to the city of Geneva*. In this he argued, *ad hominem*, that Protestantism, appealing to the Bible interpreted by private reason and not to an authoritative church, is tolerant in principle, though he admitted that in practice it had not always proved to be so. Declaring that "persecutors are more hateful than freethinkers," he proposed tolerance for all who accepted the fundamental articles of his own Deism, which he called "the human, universal, and social religion" necessarily professed by all living in society. If anyone rejected this re-

ligion, he should be banished, not for his speculative beliefs, but as an enemy to the state.

While Rousseau still lingered at the half-way house of the many who, in his generation, would enlarge the bounds of toleration without consistently demanding it for all, Voltaire urged complete liberty of conscience with a brilliance and a courage that made his efforts in this cause the most glorious and heroic part of his great services to mankind. I have not been able to find the expression often quoted and attributed to a letter from Voltaire to Helvétius: "I wholly disapprove of your opinions and will fight to the death for your right to express them"—but, if the passage be not authentic it exactly expresses the spirit of the sage who demanded freedom of conscience for all and who risked much to procure it to the obscure and persecuted. His early epic, the *Henriade*, from beginning to end denounces the evils of fanaticism and demands universal tolerance. The most celebrated passage in it, that in which Henri IV describes to Queen Elizabeth the massacre of St. Bartholomew's eve, paints in dark and lurid colors the horrors of confessional war. In the *Philosophical Dictionary*, Voltaire wrote: "The only remedy for the infectious disease of fanaticism is a philosophical temper"; and, again, in the same work:

What is tolerance? It is a privilege to which human nature is entitled: we are all so compounded of weakness and error that it behoves us mutually to forgive one another's follies. This is the very first law of nature. . . . Every man persecuting another for not being of his own opinions is a monster.

Not content with urging the duty of tolerance in abstract terms, Voltaire bravely championed the cause of obscure men who, not being of his faith, suffered persecution for their own. In 1761 Marc-Antoine Calas, the son of a Protestant merchant of Toulouse, committed suicide. Forthwith his father, Jean Calas, was charged with the murder of his son in order, it was alleged, to prevent him from becoming a Catholic. Though there was no evidence to support this charge, and plenty to disprove it, in the ex-

cited atmosphere of religious hatred Calas was tortured to make him confess the crime, was convicted though he refused to confess, and was broken on the wheel. When Voltaire first heard of the case, he gathered the impression that Calas had really been guilty; but his doubts of this were turned into certainty of the contrary by an investigation. A passion of pity and indignation impelled him to take up the cause of the victim. With enormous courage, energy, intelligence, and persistence, he forced a retrial before a higher court, and obliged this court, against its own prejudices and recalcitrance, to reverse the verdict of guilty passed by the lower court. Though the acquittal was too late to save Calas, it made an enormous impression in France; intimidated the bigots and doubtless saved many other innocent men from death. Voltaire wrote the whole thing up in a *Treatise on Tolerance* (1763), in which he not only painted the horrible injustice of the judicial murder, but urged confessional liberty on wide principles. For proof that different religions may live peaceably side by side, he pointed to the example of England, of ancient Rome, and of China. For Christian authority to tolerate, he referred to the golden rule.

Somewhat similar to the case of Calas was that of Pierre Paul Sirven, a Protestant whose daughter, in a fit of melancholy madness, drowned herself in a well. On hearing that he was about to be accused of murdering his child in order to prevent her entering a convent, Sirven fled to Geneva. Denounced and condemned to death in his absence, he succeeded in arousing the interest of Voltaire. Again with great passion and with great effectiveness the famous writer took up the case, happily not too late to save his protégé. After he had aroused public opinion, he induced Sirven to stand trial, and procured his acquittal.

In a third horrible case Voltaire also took an active interest. A youth named La Barre was accused, on insufficient evidence, of having mutilated a crucifix, and was proved to have sung some ribald songs and to have read some "bad books"—among them Voltaire's *Philosophical Dictionary*.

For these "crimes" he was put to death; and for the crime of judicially murdering him, his judges were held up, by Voltaire, to the execration of the civilized world.

As the territorialism sanctioned by the Peace of Westphalia remained throughout the eighteenth century the constitutional law of Germany, there were as many degrees of religious liberty as there were separate princes and states. While Prussia became as free as Rhode Island, Salzburg exiled 17,000 Protestants in the two years 1732-34. In general the position of Dissenters in both Catholic and Protestant states became easier throughout the century by the gradual disuse of the *jus reformandi* allowed by the Peace of Westphalia, and by the extension, against the letter and spirit of that instrument, of the *jus recipiendi et tolerandi* recommended by the publicists. When, in 1712, Count Ernst Casimir of Büdingen decreed full liberty of conscience to all trading or working in his dominions, the Imperial Treasury protested against this edict as a violation of the German constitution, and ordered it revoked. Nevertheless, in the face of official conservatism and of popular bigotry, the spirit of the Enlightenment made for an ever greater diffusion of religious liberty.

Among the first apostles of tolerance in Germany must be reckoned the lawyer and professor Christian Thomasius, who broached the subject in a debate on the question, *Is heresy a crime?* in 1697, and treated it more fully in his *History of the Struggle of the Empire and the Church in the Middle Ages*, a quarter of a century later. Maintaining that "the duty of princes is not to save souls but to preserve the peace," Thomasius deduced the right to freedom of conscience from natural law. Arguing that heresy, as an intellectual and not a moral defect, is an error and not a crime, he advocated the tolerance of all religions as long as they do not break the peace.

The teachings of Thomasius were driven home by his pupil Justus Henning Böhmer, the author of a comprehensive treatise on *Protestant Ecclesiastical Law* (1717). In this he argued that heresy is a sin rather than a crime, pun-

ishable, like ambition or avarice, not by law but by conscience. Böhmer's pupil, Carl Heinrich Fuhrmann, elaborated this position in a treatise *On the Civil Effects of Religious Toleration* (1726), in which he argued for full liberty to all but atheists. Among many other books of a juridical rather than a philosophical tenor that argued for greater freedom of conscience, those of the School of Natural Law had some influence. The writers of this school advocated the "collegiate system of church government," by which the several churches should be regarded not as subordinate branches of the civil power, but as voluntary, self-governing corporations. In this doctrine emerged the faint beginning of the separation of church and state, soon to be realized in America, but not attaining its full effect in Europe until the twentieth century.

Under the influence of German lawyers, and still more under that of Voltaire, Frederick the Great made Prussia the most tolerant country in Europe. The Jesuits, expelled from some Catholic states and refused admission in others, found in Brandenburg a place of refuge. Atheists and materialists, fleeing from the Inquisition or from savage laws, found in Berlin not only an asylum but often a warm welcome and a pension. As a freethinker himself Frederick had a supreme contempt for the confessional squabbles of Christians. On his accession he made the memorable declaration:

All religions must be tolerated, and the magistrate must notice them only to prevent any religion disturbing another; for in this country every man must go to heaven his own way.

When the pastors of Neufchâtel sent a delegation to the king to demand the punishment of a heretic who was preaching against the doctrine of eternal damnation, they received the contemptuous reply:

Since they preferred to be damned eternally, the king would gladly allow them to be so, and was pleased to think that they would find a powerful ally in the devil.

Despising Christian dogma as he did, the ruler found in Christian ethics a useful support to the state. He sought, in giving freedom to Catholics, Calvinists, Lutherans, Jews, and all others, not to extirpate the religious sentiment entirely—for that, he feared, would be dangerous to the state—but to encourage all to train men to be good citizens and lovers of their kind. Indeed, far from regarding variety of religion as a danger and weakness to the state, as almost all statesmen had hitherto done, he thought of it as a distinct advantage. Though he esteemed Luther “a mad friar and a barbarous writer,” he acknowledged a debt of gratitude to him for dividing the church so that reason could unfold, philosophy and science enlarge their boundaries, and tolerance increase. The influence of Frederick’s precept and example was great and beneficent. Burke was not the only contemporary foreign statesman who admired the unbounded toleration of the King of Prussia as of a piece “with the other grand maxims of his reign.”

With a voice more eloquent than Frederick’s, though with a hand less powerful, his enemy Lessing advanced the cause of confessional peace. In the *Education of the Human Race* he declared:

It is not true that speculation about these things [religious matters] has ever wrought mischief or been hurtful to civil society. This reproach should be made, not to those who speculate, but to those whose folly and tyranny would hinder these speculations and grudge men the free exercise of their thoughts.

Some years later, in 1779, Lessing published his drama *Nathan the Wise*, to teach the supreme lesson of religious liberty. Casting his fable in the time of the Crusades, he depicted the good Mohammedan Sultan Saladin asking the good Jew Nathan what religion is the best. Nathan answers with the story of Boccaccio, of the rich father who left his property to the son to whom he had given his ring. On his death, his three sons each claimed to have their father’s ring, and, on conference, discovered that he had given to each an exactly identical ring. No man could determine

which was the true and which the false signet; and the conclusion was reached that probably all the rings were copies of a lost original. Thus, Judaism, Christianity, and Islam all claim to be the only true gift of the Father; but no man can tell which is genuine and which is counterfeit.

This wise allegory was further emphasized by a plot that verges on the ridiculous. The hero of the play, a good Knight Templar, falls in love with a beautiful girl whom he supposes to be the daughter of Nathan the Jew. She turns out, however, to be only Nathan's adopted daughter and the Templar's own long lost sister. Before the reader has recovered his breath from this surprise, he is knocked down by the revelation that both the Templar and his sister are long lost children of Sultan Saladin. By this absurd device the author attempted to teach the useful lesson that persons of all nations and of all faiths are bound by the closest family ties, unknown to themselves.

In the Teutonic, Protestant countries outside of the Empire toleration steadily but slowly broadened. The persecuting laws extant in Sweden were relaxed somewhat under Charles XII (1682-1718) and a good deal more in the so-called "era of liberty" following his death. Secularism, Pietism, and Swedenborgianism all in different ways united to diminish the hold of dogma and of Lutheranism, until even the Catholics, though still not legally tolerated, were left unmolested.

The unbroken ascendancy of the Lutheran church in Denmark retarded the coming of religious liberty in that kingdom. Ordinances of 1730 and 1735 punished non-attendance at the established church with fine and pillory. A decree of 1748 forbade Jews to settle in Denmark, and another of 1766 excluded Moravians and Jesuits, and punished apostates and freethinkers. Not until 1771 did any notable improvement in the position of Dissenters take place.

The Swiss solution of the religious problem resembled the German in leaving the choice between Catholicism and Protestantism free to the local governments. The civil war

of 1656 had left the Catholic cantons in the ascendancy; a second religious war ended in 1712 by granting complete parity to the two confessions. Of the ruling cantons each was allowed to choose its own faith and to enforce it; in the dependent cantons both religions were permitted to exist and each was protected from molestation by the other.

The United Netherlands on the whole maintained their advanced position in the matter of tolerance throughout the period of the Enlightenment, though there were some manifestations of bigotry on the part of the clergy. When the Arminians Le Cène and Le Clerc published, in 1687, a plea for liberty of conscience, the orthodox Synod of Amsterdam condemned their tract as containing doctrines which, "under the usurped names of charity and tolerance insinuate into the mind of the reader the simple poison of Arminianism and religious indifference." Nevertheless, the apostles of freedom continued to gain ground under the leadership of Gerard Noodt, rector of the University of Leyden, who published in 1706 a pamphlet on *Religion free from the State by the Law of Nations*. In elevated tone the author urged, as reasons for toleration, the infinite number of faiths, their uncertainty, and the natural right of every man to seek happiness in his own way.

On the whole, the Catholic countries allowed less divergence from the prevailing creed than did the Protestant. The Inquisition, though commonly hated and despised as that infernal court . . . which is a good example of what the villainy of some men can contrive, and the folly of others receive . . . in spite of the first principles of natural reason, justice, and equity,⁹

continued to exist and to exert all the power allowed it by the civil ruler.

The savage persecution of Protestants in Bohemia during the years 1705-1740, drove many into exile. In 1742 the Jews were banished from this land, though they were allowed to return in 1748. In 1752 the Empress Maria

⁹ Chesterfield, letter to his son, 1749.

Theresa made conversion to Protestantism a capital offense.

By the end of the seventeenth century the Unitarians had been hunted out of Poland and the other Protestants excluded from public office and rigorously limited in the exercise of their cult. In 1724 Europe was shocked by the execution of the mayor and nine aldermen of Thorn on the charge of inciting a Protestant mob against the Jesuits.

The rise of the Jansenists to a leading position in the Spanish Netherlands led to such a recrudescence of bigotry that in 1734 the government prepared an edict threatening heretics with the stake. This edict, however, shattered on the opposition of public opinion and on the legal resistance of the Province of Hainaut. Under the protection of a more liberal culture Protestants and other heretics could thenceforth live with little molestation.

Even in the Iberian and Italian peninsulas the spirit of the intelligent classes curbed the fanatical zeal of the clergy and of the masses. Though the laws against heresy were not changed in Spain, they were suffered gradually to fall into disuse. In Portugal the king, by a law of 1751, forbade the execution of anyone by the Inquisition in an *auto-da-fé* without the special license of the government. In various Italian states, notably in Tuscany, the powers of the Holy Office and its jurisdiction over religious cases were considerably diminished by the secular governments.

CHAPTER XVI

LAWS, MORALS, AND MANNERS

I. FREEDOM OF THE PRESS

Analogous to the growth of liberty of conscience during the Enlightenment was the growth of freedom of speech and writing. All other liberties are conditioned upon freedom of thought; and this, again, is dependent on the right to expression; for thought, like money, has value only as it is circulated. In some states, notably Great Britain and Prussia, a high degree of freedom of the press was won; in others severe checks were put upon publishing.

At the time of the Revolution of 1688-89, the law subjecting the press to the control of censors still cumbered the English statute book. Notwithstanding energetic and sometimes savage efforts to enforce it, there flourished as large a clandestine trade in spiritual wares then as there was a bootleg trade in spirituous wares in America under prohibition. Heretical, treasonable, seditious, and libelous works of all sorts and of all degrees of value were smuggled into the London market and sold at large profit. Half-penny broadsides with doggerel verses, and massy quartos filled with Hebrew and Greek quotations, obscene libels and powerful treatises banned by state or church, were equally to be had by him who knew where to go for them.

Though from the list of rights demanded by the Convention Parliament that called William and Mary to the throne the demand for an uncensored press was strangely absent, and though the Licensing Act of 1685 was repassed, with some opposition, in 1693, the cause of free publication was brought forcibly to public opinion by Charles Blount, the Deist. In 1695 he published, under the pseudonym of

Philopatris, *A Just Vindication of Learning and of the Liberty of the Press*, and a little later a second work entitled *Reasons for the Liberty of Unlicenced Printing*. In these pamphlets, which were powerfully influenced by Milton's *Areopagitica* but which were not, to the extent charged by Macaulay, plagiarisms, Blount somewhat disingenuously appealed to the then heated Protestant prejudices of his public by arguing that a free press would be a hard blow to the power of Catholic clergy. As popish villainies, he asserted, arise in sacerdotal malice and lay ignorance, nothing would more effectually undermine the power of the priesthood than the free propagation of wisdom and knowledge among the populace, and this again would be best promoted by an unlicensed press. He further urged that licensing was unknown to the ancients, that it constitutes an affront to learned men, that it brands permitted books with a license tantamount to the certification that the work is "foolish enough to be printed," and that it undervalues and cheapens the taste of the nation. Incidentally, he added, the suppression of argument reflects on the church and on the government, and facilitates oppression and persecution.

In order to bring home to the public the absurdity of the licensing law, Blount published a third pamphlet ostensibly defending the censor, Edmund Bohun, but in reality reducing his favorite political theory, that William and Mary were the conquerors of England, to absurdity. Filled with delight at what he mistook for genuine support of an argument that had proved unpopular, Edmund Bohun licensed this book eagerly; but, when it was censored by Parliament, the storm that arose over the abuse of the censorship, together with the petition of some booksellers, induced Parliament to renew the Licensing Act for two years only and then, when it expired in 1695, to let it drop altogether. The apology by which the Commons defended this vote before the Lords, which dwells on the details of the act and not on its principle, shows that they had little idea of the great revolution which freed forever the press of England from the yoke of the censor. Not, indeed, from all government

supervision. Books specially obnoxious on account of their religious, political, or ethical doctrine, continued to be publicly burned from time to time by order of Parliament. But at least they could be published without previous permission. And the practice of ever larger liberty was partly promoted, partly checked, by the growth of the party system. Under the ægis of one of the two great parties, the severest censures of the government were safe; writers whose views seemed to attack them both, or to affront the common Christian sentiment of the people, were still occasionally liable to punishment.

In that age of the graphocracy, literary genius was so highly esteemed that its support was ardently courted by the rulers of the state. The virulent and able pamphlets produced in the reign of Anne brought some of their authors to the pillory or to prison. But under Walpole punishment, seen to advertise the opinions of the victims, was more and more rarely meted out to the pamphleteers. On the whole the English press was allowed to print heterodox opinions in matters of divinity and state. While some of the clergy, like Dr. Harrison in Fielding's novel *Amelia*, blamed the remissness of the government in allowing the publication of works treating Christianity as an imposture or a jest, others, like Warburton, protested that it would be unjust to ascribe the epidemic of infidelity to the freedom of the press, which wise men had long held to be a precious branch of national liberty. Of course the freethinkers rejoiced in it. Hume who, in an essay on the *Liberty of the Press*, attributed it to the mixed system of government of Great Britain, prefixed to his *Treatise on Human Nature* a quotation from Tacitus meaning, "O rare felicity of the times when one may think what one pleases and say what one thinks!"

The practice of the British American colonies varied. On the whole liberty of speech enlarged its bounds in all the colonies. The chief battle was fought in New York, when John Peter Zenger founded the *New York Weekly Journal* in 1733 and filled the early numbers with articles censuring the government. Arrested and sent to prison for

these on a warrant of the governor and council (1734) he was tried by a jury that boldly asserted its right to judge both the law and the facts, that repudiated the old maxim "the greater the truth the greater the libel," and that triumphantly acquitted Zenger of the charge of seditious libel. This meant complete liberty of the press thereafter in New York. It was rightly hailed as "the dawn of that liberty which afterwards revolutionized America."

With the exception of Prussia no German state rivaled the English-speaking nations in freedom of the press. Ever since the invention of printing, and down to the present day, the Germans have been the greatest readers in the world, and the greatest publishers of books. The book fair held every spring at Frankfort on the Main made that city at one time the international capital of bibliopoly; this supremacy passed to Leipzig in the eighteenth century. The large profits, spiritual and material, accruing to Germany through her book-trade inclined princes to look leniently on most works except those directly dangerous to their own creed or to their own power. Public opinion was more impressed by the evils of excessive book production than by its too severe restriction. It is remarkable that Leibniz, scientist, linguist, educator, and champion of culture, should have proposed a scheme for more rigid licensing than had yet been known. Not only in the interests of religion and civil order but on behalf of science and philosophy also, he demanded the setting up of an Academy of Sciences at Frankfort charged with the special duty of supervising publication of new works:

The evils of the book-trade [he opined] are many and extremely damaging to the state. While the best books can find no publisher, many that are harmful and still more that are unnecessary are printed; and no consistent principle governs the plans of the publishers.

In order, therefore, to check the "scribacity of the many" he would oblige every author to convince a board of scholars that his manuscript deserved publication before it could

be printed. This plan, proposed to the emperor, was fortunately rejected by him for the sound reason that geniuses and cultivators of the liberal arts should be free to use their talents for the public good as they saw fit.

Neither the emperor, however, nor the other princes of Germany were ready to allow any and every book to escape public condemnation. From time to time books regarded as dangerous to the government, to religion, or to morals, would be burnt by the common hangman. As a boy at Frankfort Goethe was deeply impressed by seeing a comic French romance thus ceremoniously burnt, and remarked, "It was really fearful to see a lifeless thing punished."

Something like Leibniz's scheme was adopted in Prussia when the Berlin Academy of Sciences was founded in 1700 and charged, among many other duties, with that of licensing new books. Even under Frederick I and Frederick William I, however, Prussia was fairly liberal in her censorship, and under Frederick II (1740-86) she became one of the freest states, for books, in the world. Though Frederick the Great never specifically granted freedom of the press to his subjects, he practically seldom interfered with it. He allowed the *Berlin Mercury* to give political and literary news without official supervision. Secure in his might, he even allowed stinging satires and lampoons directed against himself to be sold to his subjects. When told of the disloyalty of a subject, he merely asked, "How many men can he put into the field?" In the same spirit he once remarked: "My people and I have come to an agreement that satisfies us both: they are to say what they please, and I am to do what I please." Once when he saw a lampoon directed against himself posted up in the streets of his capital, he had it removed to a position where it could be more easily read! So liberal was he known to be that Rousseau dared to write him: "I have spoken much evil of you; perhaps I shall speak more; nevertheless, expelled from France, from Geneva, and from Bern, I come to find an asylum in your land."

There were, however, limits even to the tolerance of Frederick. While he encouraged the publication of free-thinking

attacks on religion, and while he contemptuously connived at libels on his own person, he was unwilling, in the midst of war, to allow any effective criticism of his government's drastic methods of taxation and recruiting. His enemy, Lessing, saw clearly the restrictions on expression of free opinion in Prussia, and voiced his indignation in these exaggerated, but not wholly false, terms:

Don't tell me anything about your Berlin freedom to think and write: it reduces itself to only one freedom—that of saying as many silly things against religion as one pleases. But try to find a man free to speak on other matters; try to find one that will speak the truth to distinguished courtiers; try to find any man in Berlin to stand up for the rights of subjects, or to raise his voice against blood-sucking despotism, and you will soon learn which land is even today the most slavish in Europe.

But even Lessing was not prepared to recommend absolute enfranchisement of all forms of expression. Whereas, he thought, science and philosophy should go untrammelled, fair letters and the making of pictures should be subject to restraint in the interests of morality:

We laugh [said he] when we hear that the ancients subjected even the fine arts to the civil laws; but we are not always right in laughing. Incontestably the laws must assume no power over the sciences, for the goal of science is truth. Truth is necessary to the soul and it would be tyranny to apply the least restraint to the enjoyment of this essential need. But the goal of the arts is pleasure, and pleasure is easily dispensed with.

Perhaps Denmark was imitating the Prussian system when, by a law of 1713, she ordained that all books of a general nature be submitted to her university for license, while those concerning religion and statecraft be submitted to a government official. A rescript of 1737 gave the church further power to suppress heretical works and provided still further restraints for newspapers. In 1770 the liberal minister, Struensee, granted complete freedom of the press with a gesture that won the applause of Voltaire and of the liberals throughout Europe. After a year of liberty, how-

ever, a new law aimed to crush libels against the government; and still further restrictions were adopted in 1772.

The censorship was abolished and complete liberty of the press was granted in Sweden in 1766.

In few countries was the censorship stricter than in the Swiss cantons, Protestant and Catholic alike. The censors of Bern, Lausanne, and most other cantons, prohibited, under pain of confiscation and high fines, the publication of any book without official license; and, in the interests of religion and of the privileges of the ruling classes, they prevented the importation or publication of all works deemed dangerous to morals, to faith, or to public order; and the banned books included some of the works of Voltaire and of Rousseau.

Publication continued to be tolerably free in the United Netherlands. When the Estates of Holland, in 1765, alarmed by the spread of radical French ideas, seriously considered the establishment of a censorship, they were dissuaded from doing so by the booksellers of Leyden and Amsterdam.

In Catholic Europe the *Index of Prohibited Books* continued to guard the orthodoxy of the faithful. This index, continually augmented, revised, and brought up to date, was periodically issued anew. The edition of 1758 was the most complete and, from the Catholic standpoint, the best until that of 1900. It, and its supplements, banned almost all the great works of the French *philosophes*, together with those of the Deists and freethinkers, and, of course, of the Protestants. So careful of the purity of the faith was Pope Clement XIII (1758-69) that, in addition to promulgating official lists of dangerous books, he instructed all Catholic bishops to suppress any work denying the existence of God, immortality, or the spiritual nature of man, or attacking good morals or the power of the pope. The censors found their chief difficulty not with non-Catholic works but with those produced by men of their own religion. The various parties in the church accused each other of abusing the power of the censors to crush each other's opinions. In an

effort to prevent this Benedict XIV in 1753 issued a constitution on the *Index*, providing that a Catholic book must be censured by a large number of examiners, including those of all the prominent parties in the church, before it could be branded as unreadable.

Conflicts between the papal licensors and the governments of Catholic states sometimes broke out. In 1743 Tuscany took the power of licensing books from the Holy Office in order to give it to the local bishop and some civil officers. The Austrian government, both at home and in the Austrian Netherlands, allowed the publication of works hostile to the church and to religion—even those of Montesquieu, Voltaire, and the Encyclopedists—but sternly suppressed whatever attacked despotism or royalty, and thus forbade the sale of Rousseau. In Spain the Inquisition continued to forbid the printing or importation of books dangerous to the faith; though many of them, particularly the works of Rousseau and of the other French radicals, were smuggled into the realm and secretly sold.

In no country was the battle between despotic official and rebellious writer so bitter as in France. So ready was the government to pounce upon the critic of church or state that the Abbé Galiani defined eloquence as the art of saying something without going to the Bastille for it. Or, as Beaumarchais's *Figaro* put it:

Provided I write nothing about the government, religion, politics, morality, officials, or anyone who has a claim to anything, I am at liberty to print what I choose—under the inspection of two or three censors.

The laws against unlicensed books, sufficiently drastic under Louis XIV, were strengthened in 1728 by Cardinal Fleury with the purpose of suppressing Jansenism. By a royal decree he sentenced printers and importers of heretical books to the pillory for the first offense and to the galleys for the second. In 1754, after an attempt to assassinate the king had frightened the government, death was decreed against "all those who shall be convicted of having writ-

ten or printed works intended to attack religion, to assail the royal authority, or to disturb the order and tranquillity of the realm." Ten years later, when economic questions became pressing, a decree forbade anyone to write or publish anything on public finance. An insolent police and a body of tormenting spies enforced these laws with the help of the clergy and the courts. Savage sentences of five to nine years in the galleys, of banishment, of the pillory, and of the whip, were given to the seller and to the buyer of *La Pucelle* or of *The Philosophical Dictionary*.

While vast numbers of books, most of them now forgotten, were suppressed under these laws, a surprising number were secretly supplied to the hungry public. The Jansenists published an illegal magazine, the *Nouvelles Ecclésiastiques* annually from 1728 to 1803. The works of Voltaire, Rousseau, Helvétius, Holbach, and Diderot enjoyed a large, though surreptitious, circulation. Many French books were printed in Switzerland, in Holland, or in Germany; many others were printed in France with a false attribution to a foreign printer. Many of the greatest works of French literature of the eighteenth century appeared anonymously or pseudonymously. Many clever writers resorted to ingenious subterfuges and disguises, inveighing against Mohammedanism in language that might be applied to Christianity, or criticizing Persia for the evils most prevalent in France.

An insistent demand for more freedom of the press was voiced by many liberals as far as they were able to do so. Montesquieu, in the twelfth book of *The Spirit of the Laws*, declared that the magistrate should punish only overt acts and not thoughts as crimes. The punishment of thought is an act of tyranny which he compared to the flaying of Mar-syas for having dreamed of murdering Dionysus. A mere writer should not be deemed guilty of *lèse-majesté*, nor should even intemperate abuse be punished otherwise than lightly.

Among the few civil liberties demanded by Voltaire, that of liberty of the press came first. "I know many boring

books," he averred, "but not one that is really harmful." Holbach, too, in his *Système Sociale*, stressed the importance of untrammelled expression. Helvétius devoted a chapter of his treatise *On Man* to the liberty of the press, without which, said he, "nations stagnate in ignorance." "Most governments," he added, "urge their citizens to search for truth; but almost all governments punish them for finding it."

2. THE REFORM OF THE LAWS

As the champions of the Enlightenment aimed to recast the whole of human life in order to bring it under the rule of reason, they naturally made a vigorous assault on the inconsistencies, inequities, barbarities, and abuses then interwoven in the administration of civil and criminal justice. Together with reason, which condemned the law as a barbarous puzzle, the heart, which found it revoltingly cruel, coöperated in an extensive and beneficent reform.

An abuse felt keenly by the rising middle class was the respect of persons shown by the guardians of the law. Even in England, less obnoxious to criticism in this matter than were most other European countries, a peer enjoyed outrageous privileges and immunities. If sued at law he might easily impede the course of justice. If a rude word, such as he might speak with impunity to a commoner, were used towards him, he could vindicate his insulted dignity by civil and criminal proceedings. Even for murder he rarely suffered any penalty. When Lord Mohun went about openly to slay an actor, the constables dared not arrest him; and after the murder, though he was arrested and tried, he was acquitted by the House of Lords.

Even against commoners the laws were inefficiently and corruptly, though savagely, enforced. Defoe, in several tracts proposing methods of making the London streets safe, complained of the lack of lighting and the insufficiency of the police. Henry Fielding, speaking from experience as a barrister and as Justice of the Peace for Westminster, bitterly satirized the administration of the laws in the first

chapters of his novel *Amelia* (1751). While he found the excellence of the English constitution universally acclaimed, he declared that it worked so ill in practice that it was like a "machine excellently made, though incapable of performing its functions." The magistrates were generally both ignorant of law and venal, he asserted; and the watchmen "chosen out of poor, old, decrepit people who are, from their want of bodily strength, incapable of getting a livelihood by work."

Though poorly enforced, the penal code of England was rigorous at the end of the seventeenth century and became increasingly so throughout the eighteenth. The death penalty having been earlier affixed to the stealing of a sum of money then considerable, was still enforced for stealing the same sum, even though the great fall in the value of money made the sum involved trifling. Moreover, many new capital offenses were added to the statute book. Prior to the Revolution of 1688-89 there were not more than fifty capital crimes; sixty-three new capital offenses were added during the reign of George II, and a large number in the next reign. Most of these new crimes were those directed against property; and the cause of their imposition was partly the rise to power of the moneyed class. Stealing a horse or a sheep, forty shillings from a house, five shillings from a shop or one shilling from a pocket, was punishable by death. On the other hand, neither perjury nor assault resulting in any injury short of death, was capital. Under these laws so many persons suffered execution that some writers have suggested that the highly law-abiding quality of modern England is due to the extermination of the criminal strains in the population. If so, the eugenic process was a fearful one while it lasted.

Not only were the executions numerous but they were cruel and public. The torture or death of a criminal was a favorite spectacle not only with the riff-raff but with ladies and gentlemen of wealth, fashion, and education. The law making women guilty of high or petty treason (this last meant murder of a husband) liable to death by fire was not

repealed until 1790; the law permitting the application of the *peine forte et dure* was not repealed until 1771, though it was rarely or ever applied in English courts after 1735. The use of torture to extract confession was not abolished in Scotland until the Treason Act of 1709. Twenty years earlier the Scottish Claim of Right, while declaring torture to be contrary to law in ordinary cases or without evidence, had tacitly sanctioned it in extraordinary cases, where the evidence against the accused was strong.

An important reform in the antiquated judicial procedure of the English courts was made by the act of 1696 regulating the process of trials for treason. This bill set a three-year limit from the date of the offense for prosecution, except in case of the assassination or injury of the king. Contrary to the old custom, the accused was now to be given a copy of the indictment five days before the trial, and a list of the jury panel two days before the trial; and he was also allowed the assistance of two counsels. Among other protections granted him were the provisions that no evidence to any overt act except those specified in the indictment might be offered, and that conviction could take place only on the testimony of two witnesses to the same overt act. From the operation of this act, which stands at the head of the movement to humanize and rationalize the law, were exempted impeachments, which were not brought to the requirements of the ordinary courts until 1748.

The progressive secularization of the law was witnessed by the Marriage Act of 1753 which treated marriages, though celebrated with proper religious rights, as null if certain legal requirements were wanting. The acceptance of this bill by the House of Lords and the whole bench of bishops, proves that in public opinion the state was ever more freely assuming the quondam prerogatives of the church.

The classical commentator and expounder of English law in the eighteenth century was William Blackstone (1723-80), who was educated at Oxford and called to the bar by the Middle Temple. After writing on *Magna Charta*,

consanguinity, and copyhold, he became, in 1758, first Vinerian professor of law at Oxford, and, twelve years later, judge of the Common Pleas. His renowned lectures at Oxford were published in four volumes under the title *Commentaries on the Laws of England* (1765-69). As a pioneer in the study of the common law at the universities, he made it equal in esteem as a liberal subject to the study of the Roman Civil Code, which had been taught at both Oxford and Cambridge since the Middle Ages. Explaining the continuity, unity, and reason of the common law, he brought it into relation with history, politics, and philosophy, and reduced to lucid and systematic statement the disordered bulk of precedents and statutes that had accumulated since Bracton had performed the like service for his own age about five centuries earlier. Though he lacked originality, and though he borrowed his legal and political philosophy, with some misapprehensions and some confusion, from Pufendorf, Locke, and Montesquieu, he showed fine judgment in explaining laws in the light of their historical development, and a remarkably comprehensive view in reducing the disparate elements to a consistent whole. While his influence in England was less than that of Coke, in America it proved to be a dominant force in the creation of legal and political institutions. With no more than the exaggeration and one-sidedness inherent in any epigram, it has been said that the Constitution of the United States was founded on Blackstone's misunderstanding of Montesquieu's misunderstanding of the English constitution.

The legal theory of the colonies of Great Britain was brought straight from England, and the laws and precedents of the mother country were long assumed to be in force. Certain improvements on English practice were incorporated in the codes drawn up in the various colonies, notably in those of Massachusetts and New Haven in the middle seventeenth century. These codes were copied largely in the so-called Duke's Laws of New York (1665); and as this was again copied by the legislators of Pennsylvania and Delaware, a somewhat more liberal and humane spirit pre-

vailed in the courts of large parts of America than was customary in England. On the other hand the common law was to some extent impoverished, when transported to America, because the colonists for a long time did not need so technical and advanced a law. Not until the eighteenth century did courts and trained lawyers develop in the colonies. The rise of complex problems, political and economic, and the need for protection against the encroachments of the British crown and Parliament, gave rise to an assiduous study of the common law, and recommended to the colonists the theory of its supremacy. In no country, after the middle of the eighteenth century, were books of jurisprudence so eagerly and widely read as in America. In the end, the colonists received the great body of English decisions, the law merchant, parts of the canon law and of international law, together with a great tradition and the materials with which to develop it.

Turning from the English-speaking nations to the Latin, Teutonic, and Slavic races of Europe, we find that in many of them much progress was made in reforming and humanizing the laws. In the half century before the French Revolution, torture was abolished in Prussia, Russia, Austria, Poland, Switzerland, Hesse, Tuscany, Denmark and Sweden, and fell into general disuse in other countries. In Germany the labors of a series of gifted jurists and of an enlightened despot carried the work furthest. Leibniz, notwithstanding his great admiration for the Roman *Corpus juris*, pointed out the need for a new code which should draw its materials partly from natural law, and partly from the Justinian code, emended and developed by reason and experience. His labors were supplemented by those of Thomasius, who protested against the hideous cruelties exercised by the hangman, by C. G. Hoffmann, by Cocceji, by J. A. Cramer and by others, who reduced the laws of the Holy Roman Empire to a more consistent and manageable whole. Partly under their tuition, partly inspired by the humane teachings of Voltaire, Frederick the Great abolished torture in Prussia as one of the first acts of his reign (1740). Presently he

charged Cocceji with the duty of reforming the code, which was done, after more than twenty years' labor.

A similar reform of Danish law was carried through by the progressive minister Struensee in 1771. The old code had been complicated, inefficient, and costly; torture was still used in the judicial inquisition; capital crimes were numerous and penalties severe. The new code of 1771 tried to abolish respect of persons, made torture illegal, reduced the number of capital crimes by taking from that list theft, abortion, and infanticide, and simplified the rules of evidence. This reform, however, proved so much in advance of public opinion that it was largely repealed in 1772.

The most radical and philosophical of all the codes proposed in the eighteenth century was that which Catherine II tried to enact for Russia. Peter the Great (1682-1725) and his successors had felt the need of a new code, and had appointed committees to investigate the matter, but had done nothing further. Catherine II, the disciple of the *philosophes*, issued *Instructions to a Committee for Drafting a New Code*, a code which should conform to the laws of reason as expounded by Voltaire. With him she corresponded on the subject; and she studied the precepts of Montesquieu, Beilfeld, Beccaria, and other eminent jurists of the new school. Under their tuition she laid down the most enlightened principles for her lawyers to follow. She began by pointing out Russia's need for an absolute and centralized government; she then discussed the condition of the various classes of citizens, the nature of crime and punishment, and the claims of natural rights and of tolerance. In twenty chapters she demanded the abolition of torture and of the other abuses which lay heavy on the Russian courts. This *Instruction*, printed in Russian, Latin, French, and German in 1767, and translated into English in 1768, won more fame for its author than real relief for her subjects. Though the Committee on Legal Reform, to which the *Instruction* was referred, met and deliberated long, it came to no conclusion. Without the support of her lawyers even the despot of Russia did not feel strong enough

to enact all the laws necessary to implement her own project of reform. Much of it was therefore left in abeyance; though it doubtless discouraged, or completely checked, the worst abuses in practice.

Some reforms were made, and more were demanded, in the Italian states. Venice began in 1732 to make her streets safe at night by partially illuminating them, and by increasing her police. Casanova, speaking from personal experience, noted with astonishment that whereas in England, where every man was brave, a single constable was deemed sufficient to effect an arrest, in Italy, the land of cowards, a large squad of policemen would be sent against a law-breaker.

Among a number of eminent jurists to demand reform of the Italian laws, Gianvincenzo Gravina (1664-1718) may be taken as typical. His works on the origins of law, and on the Roman empire, maintain that codes derive their sanction from reason, and are therefore to conform to its dictates. Justice and the general happiness are to be found only in the application of reason to human government.

Far more famous was Cesare Bonesana, Marchese di Beccaria (1738-94), a Milanese noble educated at the Jesuit college at Parma. After serving two years in the Austrian army, he returned to Milan about 1760 to engage in literary and juridical pursuits. As his brother Alessandro held the office of Protector of Prisoners, Cesare had the opportunity of studying at first hand the miserable condition of the sufferers from the rigors, and often from the venality, of the current administration of justice. His sense of the deficiencies of the social system was stimulated by reading Montesquieu, d'Alembert, Diderot, Helvétius, Buffon, Holbach, Hume, and other leaders of advanced thought. From them he learned that the object of punishment should be reform and not vengeance, and that the guiding principle of social regulation should be "the greatest happiness divided among the greater number." This maxim, made famous by Bentham and the English utilitarians, already illuminated

the thought of French Encyclopedists and of Italian publicists.

At Milan Beccaria joined a famous liberal club, and began, with others, to publish the journal, *Il Caffè*. Under the stimulus of radical associates, and with much literary assistance from Pietro Verri, he published, in 1764, his famous treatise on *Crimes and Punishments*. In this he urged a utilitarian, humanitarian, and rational reform of judicial practice and of the application of penalties. Law should be certain and invariable. Crimes should be measured by the social injury they do and not by transcendental standards or by respect of persons. Punishments should be graded in proportion to the heinousness of the crime committed. Certainty of penalty is a more efficacious deterrent than cruelty. The arbitrary, both in the definition of crime and in the application of the law, should be excluded. Capital punishment Beccaria thought inadmissible as contrary to natural right and inexpedient as irrevocable in case of error. Accusations should be open. Torture should be abolished as useless, wrong, barbarous, and worse for the innocent than for the guilty. Finally, the laws should seek not only to repress crime, but to prevent it. This would largely be done by making law clear, just, and inexorable; and more might be accomplished by education and by granting rewards for good deeds.

The tract that presented, with much fashionable rhetoric, the favorite ideas of the advanced thinkers of the age, received enormous acclaim. It was translated at once into French and soon into other tongues. Voltaire declared it "sufficient to sweep from jurisprudence the relics of barbarism." Blackstone quoted it with respect. Catherine of Russia and other progressive rulers accepted it as the gospel of juridical reform.

In no country was the contrast between the existing system of ancient abuse and the radical demand for social reform so sharp as in France. Nowhere were the laws more cruelly and corruptly administered; nowhere was the program of the publicists more enlightened or more insistent.

In France, as elsewhere, while the noble could commit most crimes with impunity, the plebeian was savagely chastised for light offenses. When the Duchesse de Bouillon, jealous of the actress Adrienne Lecouvreur, sent her poison of which she died, the Duchess was not even questioned in the courts, but her ignorant tool, a poor barber, was imprisoned and then made away with. Against ordinary crimes such terrible vengeance was decreed as the galleys and breaking on the wheel; and in the case of acts of special heinousness, as Damien's attempt to assassinate the king, all the horrid precedents were ransacked to provide torments of fiendish ingenuity.

The lawyers themselves began, in the reign of the Grand Monarch, to propose a recodification of the perplexing and self-contradictory practices of the courts. Jean Doumat (1625-96) in a remarkable treatise on *The Civil Laws in Their Natural Order* (1689-94) recast the whole system of jurisprudence in a natural and consistent code, based equally on reason and on history. It was the first thorough, and perhaps the best, attempt at needed simplification before the time of Napoleon.

The great work of Montesquieu naturally devoted much thought to the nature and reform of law. The classification of crimes, the modes of repressing them, and the penalties attached to them, he pointed out, vary with the constitution of the state and with the character of the nation. In despotisms laws are simple and penalties severe; in republics laws are complex and penalties mild; in monarchies a middle course, in both respects, is taken. Experience has shown that purity and certainty of administration is a more certain deterrent to wrong acts than are cruel punishments. When the police have been improved and the courts reformed, torture will lapse as an unnecessary aid to the magistrate.

Very remarkable proposals for improvement were made by La Mettrie in the work, *Man a Machine*, that was, in this respect, too far in advance of its age to exercise much immediate influence. As a materialist and a determinist,

the author believed that crimes, like all other acts, are committed under the pressure of irresistible impulses—impulses often due to abnormal mental conditions. Gaston d'Orléans could not help stealing, for he was a kleptomaniac. Women in puerperal fever commit crimes for which they are not responsible. Starvation extinguishes the sentiments of right and expediency to the point of making its victims incapable of exercising restraint. Maniacs have often been broken on the wheel or burnt alive not for their wickedness but for mental disease. In short:

It would be desirable to have for judges none but the most skillful physicians. They alone can distinguish the innocent from the culpable.

This demand for a psychological treatment of the criminal has only been revived in the last few years by the most eminent and advanced social reformers.

If the will is not free, what is the justification for punishment at all? Holbach considered and answered this question. The will, said he, though not free, is influenced by the conditions of its environment. The appointment of penalties for certain acts, and the example of these penalties, change the conditions under which men act; hence it is expedient to discourage anti-social behavior by making its consequences painful. But the only justification for punishment being the prevention of injury to society, those acts, and those acts only, that actually do diminish social happiness, should be visited with social vengeance.

Voltaire, finding in Beccaria many of his own humane and rational ideas, wrote a commentary illustrating and enforcing his arguments. Some years later, in 1777, he published an epoch-making tract called *The Prize of Justice and Humanity*. In this he advocated trial by jury instead of by the judges of the parlements; he protested against the infliction of death and other heavy penalties for small offenses; and he denounced punishing heresy, the expression of opinion, or most sexual vice; and he inveighed against the use of torture to extract confession.

The total effect of all these demands for reform was very considerable. Speaking of the third quarter of the eighteenth century Goethe, in his autobiography, well summarized the general tendencies:

As in every epoch all things hang together, inasmuch as the prevailing opinions and sentiments ramify in manifold ways, so jurisprudence began gradually to follow the maxims which were established in the treatment of religion and morality. Humanitarianism spread first among the young lawyers, then among the older judges; and they all strove to be as humane as possible even in legal relations. Prisons were improved, crimes pardoned, punishments softened, legitimations made easier, divorces and annulments of marriage permitted.

In two respects the humane spirit observed by Goethe produced notable results, in the treatment of bankrupts and in the improvement of prisons generally. The law then presumed all debtors solvent, ordered them to pay and, on failure to do so, imprisoned them until they could do so, which generally meant for life, thus scourging misfortune or indiscretion with a punishment fit only for the greatest crimes. The fate of the unhappy bankrupt was not even left to an impartial judge, but was inflicted at the option of an interested and exasperated creditor.

Once in prison, debtors suffered privations and cruelties even worse than those endured by ordinary convicts. With inconceivable inhumanity and folly they were not supported by the state, but were obliged to pay for their own board and bed. The pitiful picture of a debtor's prison in Fielding's *Amelia* shows, without exaggeration, the prisoners who could not pay stripped, abused, and beaten, left to starve or to endure cold and damp until they died of hardship. In 1759 Dr. Johnson estimated that of twenty thousand bankrupts imprisoned each year, one quarter died of privation within twelve months.

As early as 1691 a book described their wrongs without exciting enough attention to secure redress. But in 1729 a philanthropist named Oglethorpe obtained a Parliamentary

inquiry into the condition of Fleet and Marshalsea prisons. The commissioners' report of horrible conditions moved the public heart, and they were celebrated by James Thomson as

the generous band
Who, touched by human woe, redressive searched
Into the horrors of the gloomy jail.

Not only bankrupts but even criminals were now felt to be too harshly, and too unwisely, treated. Defoe declared, in *Moll Flanders* (1722): "There are more thieves and rogues made by that one prison of Newgate than by all the clubs and societies of villainy in the nation." Oliver Goldsmith depicted the good Vicar of Wakefield trying, while in prison, to educate the convicts in industry and religion.

It were highly to be wished [declared the Vicar] that legislative power would thus direct the law rather to reformation than severity; that it would seem convinced that the work of eradicating crimes is not by making punishments familiar but formidable. Thus, instead of our present prisons, which find or make men guilty, which enclose wretches for the commission of one crime, and return them, if returned alive, fitted for the perpetration of thousands; we should see, as in other parts of Europe, places of penitence and solitude, where the accused might be attended by such as could give them repentance, if guilty, or new motives to virtue, if innocent.

No marked reform of English jails, however, was achieved until after John Howard's famous report on the *State of the Prisons* in 1777. Other countries had made some steps in the right direction. In America, and especially in Pennsylvania, the treatment of convicts marked a distinct advance. Not only were food and bedding supplied to all prisoners, but some effort was made at reforming them. A new path was broken by Clement XI when he erected a prison for youths at Rome in which offenders were separated into classes according to age and moral condition; in which each man was given a cell at night and work in the day; and in which religious exercises and instructions were provided.

Similar houses of correction were erected in Florence and other Italian cities.

3. HUMANITARIANISM

What all these legal reforms reveal is the rise of a new spirit of humanitarianism. Not that kindliness, social sympathies, and abhorrence of cruelty were altogether unknown before the eighteenth century. And yet, the humane spirit that sees clearly enough and feels keenly enough the wrongs of the lowly and disinherited to make strenuous efforts to redress those wrongs and to diffuse happiness among all classes, is, in its extent and nature, a decidedly recent phenomenon. It is, as much as the progress of invention or the spread of elementary education, a characteristic note of the last two, or two and a half, centuries. It is a phenomenon never yet sufficiently noticed, or studied, and yet, as the most important new element in the moral tone of the Enlightenment, one that deserves and repays the most thoughtful consideration.

Why should ancient abuses suddenly be felt as novel wrongs? Why should the old precepts of religion inculcating love and the teachings of the philosophers recommending brotherly kindness take on a fresh meaning and a wider application than had hitherto been given them? Without attempting to explain every factor involved in this marked change of feeling, the historian can certainly disengage some of the social conditions that favored the evolution of humanitarianism and some of the antecedents that gave it birth.

The first of these causes was the increasing application of reason to human affairs. Passion is a poor adviser even to intelligent selfishness. But reason saw, as soon as she had the power and wish to turn her eyes to the foundations of society, the futility as well as the cruelty of vindictive penalties and of oppression. Not only in the interests of the poor and of the criminal, but in those of the creditor and of the well-to-do and of the honest, it was found expedient

to cure the ulcers that drained away the strength of the body politic.

A second cause was the growing secularization of politics. It is paradoxical, but true, to say that the religion of love has all too often produced anything but happiness. By holding before men's eyes an eternity of bliss or of torment, compared to which the petty joys and pains of this life sink into insignificance, religion had neglected the cultivation of mundane happiness and had sanctioned means of the utmost rigor to shepherd men into the paths of salvation. Indeed, as long as it was felt that earthly suffering is rather beneficial to the soul than otherwise, a certain merit accrued to its infliction. But when the vision of eternity began to fade before men's eyes, the pleasures and woes of this life assumed importance worthy of being made the chief object of statesmanship.

The diffusion of the means of communication served to bring to widespread attention evils hitherto lurking in the obscurity of general oblivion. Nowadays, a vigilant press informs the public of injustices and incites it to protest against them. The passions of the mob, so easily worked up and so often deleterious, can be sometimes turned into a flaming hatred of oppression and cruelty that will burn away abuses. Probably the increase of wealth, so marked in modern times, has also tended to smoothe the path towards reform. Philanthropy and generosity are luxuries better afforded by a rich than by a poor society. Though the church inculcated the giving of alms, and though she raised and spent great sums for religious and charitable purposes, she never commanded such enormous resources as have been placed at the service of the public, and particularly of the needy, by the growth of humanitarian sentiment.

But of all the causes that have promoted social kindness and sympathy the break-down of the class system of society and the gradual elevation of the masses, first in wealth and education and then in political influence and power, has been by far the strongest. In this respect cultural and economic advance preceded political democracy. The great

popular revolutions that took place during the last quarter of the eighteenth and throughout the nineteenth century were but the consequence of the wider diffusion of wealth and of intelligence that had ensued on the commercial revolution and the multiplication of books in the sixteenth and seventeenth and early eighteenth centuries. It is easy to see *a priori*, and to verify *a posteriori*, the reason why this elevation of the lower and middle classes and their increasing weight in forming public opinion and in shaping public policy should have expanded the sympathies of the world. Sympathy literally means "feeling with," and is dependent largely on the perception of some degree of similarity between the sympathizer and the object of his compassion. A man feels more sympathy with a dog than with a fly, more with a man than with a dog, more with a man of his own race than with an alien, more with a member of his family than with a stranger. The sharp division of society into classes narrows the benevolence of the individual to members of his own class. And when only the upper classes make public opinion and give the tone to policy, to ethics, and to fashions, only the sufferings of the rich and great stir the passions of society. But as the classes that had hitherto been the victims of injustice and oppression began to assert their claims to a common humanity, they protested vigorously against unequal laws, against the exploitation of one section of the population by another, and finally, rather by analogy than by direct solidarity of feeling and interest, against all unnecessary cruelty and pain.

That the rise of humanitarianism marched hand in hand with the expansion of social sympathies is patent to every student of eighteenth-century literature. Poets, philosophers, and novelists joined to acclaim the lowly and the common. The greatest lyric of the Enlightenment is an elegy on the pathetic lot of the masses:

Let not ambition mock their useful toil
Their humble joys and destiny obscure,
Nor grandeur hear with a disdainful smile
The short and simple annals of the poor.

The favorite pastoral poet of the age admonished "the masters" to

Be mindful of the rough laborious hand
That sinks you soft in luxury and ease. . . .
And, oh, be mindful of that sparing board
Which covers yours with luxury profuse.

While snobbery still bowed and scraped before title and illustrious descent, many people began to think, with Franklin, that a virtuous plowman is worth more than a vicious prince, and that a man should be valued for his own worth, not for that of his ancestors. Richard Savage declared it nobler "to build a generous race" than to be "the tenth transmitter of a foolish face." Adam Smith exposed the illusion by which more compassion is felt for the sufferer of high, than for one of low, rank—more for Charles I than for all the innocent common men slaughtered in the civil war. Goldsmith vigorously protested:

While the slightest inconveniences of the great are magnified into calamities, while tragedy mouths at their sufferings in all the strains of eloquence, the miseries of the poor are entirely disregarded. And yet some of the lower ranks of the people undergo more real hardship in one day than those of a more exalted station suffer in their whole lives.

A generation or more before Goldsmith wrote this the English dramatists had begun to place the woes and the struggles of the middle and lower classes in a kindly light. Nicholas Rowe did this in his play, *The Fair Penitent*, and justified the procedure thus in the prologue:

Long has the Fate of Kings and Empires been
The common business of the tragic scene,
As if misfortune made the throne her seat,
And none cou'd be unhappy but the great.
Stories like these with wonder we may hear,
But far remote, and in a higher sphere,
We ne'er can pity what we ne'er can share;
Therefore an humbler theme our author chose,
A melancholy tale of private woes.

Of this type of tragedy George Lillo's *George Barnwell* (1731) may be taken as another example. The purpose of this absurdly moralizing piece is to show the bad end of vice and crime. Its really notable feat is to bring the middle class into a tragedy, and to defend the innovation in the following striking words in the preface:

Tragedy is so far from losing its dignity by being accommodated to the circumstances of the generality of mankind that it is more truly august in proportion to the extent of its influence and the numbers that are properly affected by it. . . . If princes, &c., were alone liable to misfortune, arising from vice or weakness in themselves or others, there would be good reason for confining the characters in tragedy to those of superior rank; but since the contrary is evident, nothing can be more reasonable than to proportion the remedy to the disease.

From Lillo and other English models Lessing and Gebler learned how to write "bourgeois tragedies" for the German public. The sorrows of a plebeian, the seduction of a girl of the people by a prince, the hardships of the poor, came to be felt as more moving than the death of a king or the adultery of a nobleman's wife.

In a thousand ways the new spirit of social sympathy began to flavor the thought and culture of the time. America, the land of brotherhood, and Quakerism, the religion of friendliness, produced their loveliest expression in the *Journal of the Life and Travels of John Woolman in the Service of the Gospel*. This Pennsylvania Friend (1720-72) felt and expressed a deep sympathy with all men, and especially with the outcasts of the world. He opposed many social wrongs, and championed the cause of the poor and of the slave. In England the Wesleyan movement produced some philanthropic efforts to alleviate the condition of the poor, though in general the Methodists felt it to be their primary duty to reform the morals rather than to assuage the sufferings of the lower classes. In the secular field Daniel Defoe was the first social reformer of the modern age. Combining a consuming interest in the problems of

poverty, unemployment, old age, and feminism, with a journalist's instinct for appealing to the newly aroused social passions, he propounded many ingenious and well-meant schemes for improving the lot of the common people.

The eighteenth century saw the rise of that protest against slavery that was destined in the next age to abolish it. At the opening of the period few had felt that the enslavement of the blacks was wrong. In England universal satisfaction was expressed with that article of the Peace of Utrecht (1713) that made England the great slave-trader of the world. The ardent evangelist John Newton had, before entering the ministry of the Gospel, engaged in the slave trade for some years, and gave it up, not because he thought it cruel, but because he found it too interesting and lucrative for the good of his soul. The horrors of the transportation of the blacks from Africa to America had yet to be described. In America the lot of the slaves varied much. In the tropics and semi-tropics they were often worked to death under the lash. In temperate climates and as household servants they were usually well treated. Only under the fear of Negro risings was much harshness shown in the northern colonies. But, when conspiracies were actually detected, they were crushed with hanging, burning at the stake, and breaking on the wheel. In French Louisiana the relations of the whites and blacks were regulated by the *Code Noir* of 1724. While fairly harsh, it protected the slaves to some extent and even provided for the possibility of manumission.

Even in the seventeenth century a few voices had cried out against the wrong. George Fox, Richard Baxter, and Aphra Behn protested. Mrs. Behn's novel, *Oroonoko* (1688) made a hero of a Negro slave who is depicted not only as much nobler than his captors but as a model of virtue and chivalrous manners in every respect. In the eighteenth century Defoe, Thomson, Savage, and Paley denounced the slave trade. An act of Parliament in 1750, while describing it as advantageous to Britain and necessary for her colonies, regulated it. William and Edmund Burke,

in their *Account of the European Settlements in America* (1758) described the trade as immensely lucrative, expressed the fear that the overwhelming numbers of negroes in the West Indies might bring about a successful rebellion against the whites, expatiated on the misery of the slaves, and proposed gradual emancipation. Adam Smith denounced the slave trade; Wesley declared all slavery wrong; and in America Woolman, John Trumbull, and others labored for the enfranchisement of the blacks, or for their more humane treatment. The question, long pending, whether a slave imported into England would be free, was finally decided in favor of liberty in 1772.

On the European continent there was some protest against slavery, or its abuses. In 1741 Benedict XIV issued a bull forbidding the kidnapping and enslavement of American Indians. King Joseph I of Portugal forbade this in Brazil in 1755, but only with the purpose of fostering the commerce in Negroes. In 1770 the Abbé Raynal published an eloquent and effective protest against slavery and the slave-trade in his *History of European Establishments in the East and West Indies*. Buffon also protested against the horrors of Negro servitude.

Expanding their sympathies to include not only humanity but the brute creatures, people now began more frequently to protest against all wanton cruelty. The popularity of bull-baiting and bear-baiting declined, though the passion for cock-fighting remained strong. Vivisection, engaged in partly to satisfy newly aroused anatomical interests, was common, was often abused, and was occasionally denounced, as it was by Pope. In some quarters hunting and fishing were decried as cruel sports. James Thomson wrote:

Let not, on thy hook, the tortured worm
Convulsive twist in agonizing folds,

and Horace Walpole declared fishing to be no innocent amusement, and asked why one should find sport in the torture and destruction of animals. Hogarth in 1751 pub-

lished pictures entitled *Four Stages of Cruelty*, "with the hope," as he explained,

of correcting, in some degree, that barbarous treatment of animals the very sight of which renders the streets of our metropolis so distressing to every feeling of the mind. If they have had this effect, and checked the progress of cruelty, I am more proud of having been the author than I should be of having painted Raphael's cartoons.

Among the many virtues of Newton celebrated by Voltaire, his kindness to animals was one of the most approved.

If Englishmen took the lead in denouncing cruelty to slaves and to animals, the French *philosophes* most ardently espoused the cause of pacifism. A few Englishmen did, indeed, labor for the abolition of war. William Penn's *Essay towards the Present and Future Peace of Europe*, though Utopian, expresses his humanity and reveals an enlightened vision. Tucker, the Dean of Gloucester, famous chiefly for his economic writings, declared war to be an injury to victor as well as to vanquished, and even added: "Love of country hath no place in the catalogue of Christian virtues."

Much more impressive were the numerous French plans for insuring peace and for cultivating pacific sentiments. In 1712 the Abbé de Saint-Pierre wrote a long memoir on *Perpetual Peace in Europe*, which was published, in three volumes, in 1717. In this, and in another work on *The Grand Alliance*, he urged the great powers of Europe to enter into a league of nations with the purpose of preventing war by a mutual guarantee of aid against any breaker of the peace.

These tracts, however, had very little effect. As Frederick the Great wrote Voltaire:

The Abbé de Saint-Pierre . . . has sent me a beautiful book on the way to establish peace in Europe and to retain it forever. The thing is most practicable; for its success all that is lacking is the consent of Europe and a few similar trifles. . . . It is now the fashion to make war and I presume this fashion will last a long time.

But Voltaire himself often pointed out the absurdity and wickedness of war, as in the words in his *Philosophical Dictionary*:

Truly that is a noble art which desolates countries, destroys habitations, and causes the death of from forty to a hundred thousand men a year! . . . The most amazing part of this infernal enterprise is that each murderous chief causes his colors to be blessed, and solemnly invokes God before he goes to exterminate his neighbors!

Rousseau, too, labored to create pacific sentiment. In 1759 he wrote, but did not publish, a fragment on *The State of War*, attacking Grotius for having admitted that any war could be legitimate. In 1761 he reëdited, in abridged form, Saint-Pierre's *Perpetual Peace* with additional arguments for a confederation to preserve the condition of national amity. He even wrote to Frederick the Great urging him to sheathe his sword. Holbach and other *philosophes* warmly seconded these efforts to abolish war.

4. MORALS AND MANNERS

Except in the matters just described the Enlightenment showed little improvement or change in morals or manners. At all times the complaint of the deterioration of morals has been heard. In 1701 John Evelyn wrote to Pepys:

Never was this nation so atheistical, false, unsteady, covetous, self-interested, impudently detracting and uncharitable, ingrateful, lewd and luxurious, in a word so universally vicious, dissolute and perverted as it is now.

And again in 1769 Horace Walpole declared:

Riches, abuse, cabals, are so enormously overgrown that one wants conception and words to comprehend and describe them. Even Jewish prophets would have found Eastern hyperboles deficient, if Nineveh had been half so extravagant, luxurious, and rapacious as this wicked good town of London.

Such denunciation of current wickedness might be multiplied *ad libitum*.

Public policy was guided on frankly avowed, or poorly dissembled, principles of national selfishness. The "reason of state" was pleaded to excuse breaches of faith; the "policy of convenience" was the name given to the theory that statecraft should be guided by practical considerations rather than by justice. Frederick the Great opined that the German princes had brought all wickedness into a scientific system, and that acts regarded as crimes in private life were acclaimed as virtues in governors.

Nor were governments honest in dealing with their own citizens. Gay satirized the venality of officials in the lines:

If you at an office solicit your due
And would not have morals neglected,
You must quicken the clerk with a perquisite, too,
To do what his duty directed.

Life and property were less well protected than they are now in the same countries. Bands of criminals roamed the streets of the cities at night. In London they were called "Mohawks" and their favorite sports, after the business of robbery had been attended to, were beating the constables, turning women upside down, and "tipping the lion," a slang phrase for gouging out the eyes of their victims. Highwaymen infested the country roads; and some of them, like Gay's MacHeath, were regarded with sentimental fondness by the young women of all classes. Piracy was rife on the high seas, especially in the Indian Ocean and in the Caribbean. The most famous of the rovers of the sea was Captain William Kidd who began as a privateer with a commission to attack pirates, and then, under pressure from his crew, turned pirate himself, and was finally captured and hung.

Much suffering, orgies of prodigality, losses of fortunes, waves of crime, and suicide, followed the stock-gambling manias which then, as now, periodically swept over the world. John Law's Mississippi Company, and the burst-

ing of the South Sea Bubble, plunged England and France into a hysteria of gambling.

Dueling continued to be the common method of avenging insults. It was a privilege of all gentlemen to carry swords; and if the survivor of a duel could show that he had murdered his enemy in fair play, he was imprisoned for a short term, or pleaded his clergy, was touched with cold iron, and set free. Immense numbers of prominent men fought duels. Though the clergy denounced private combat as a modern custom unknown to the Greeks and Romans, introduced by the barbarians, and as an audacious defiance of Christian law, the military and feudal classes regarded it as an integral part of the code of honor. In America the sentiment of the age was more against it than elsewhere. There even a professional soldier like Washington could decline to fight a duel on a frivolous occasion without losing caste. That he did so refuse is not one of Parson Weems's goody-goody stories, but a fact recently authenticated.

The state and the church devoted much effort to suppressing not only vice but luxury and frivolous amusement. Fénelon in *Télémaque* (1699) stated that despotism in the king and luxury in the people were the two worst evils in the body politic. He would forbid the importation of exotic wares, enforce frugality and simplicity in food and clothing, distinguish each class of citizen by dress, and encourage by law a rural rather than an urban life. Montesquieu also believed sumptuary laws in the interest of frugality advantageous to the nation. Throughout Europe various forms of frivolous amusement were forbidden by statute and various observances of religious duties were enforced. In British America the laws remained decidedly blue not only in New England but in the middle and southern colonies where observance of Sunday and attendance at church were frequently made obligatory.

To supplement the efforts of the government religious men formed associations to discourage and repress vice; of these the English Society for the Reformation of Manners

was the most notable. In it churchmen and Dissenters co-operated in issuing thousands of tracts urging temperance, public decency, and observance of the sabbath. When persuasion failed, the Society instituted prosecutions and carried its zeal for righteousness so far that it finally led to a dangerous popular reaction. Magistrates began to refuse to hear evidence from philanthropic spies; and mobs attacked, and in one case murdered, their would-be reformers.

Among the vices to attract the attention of government, especially in England, drunkenness was prominent. Before the eighteenth century beer had been the favorite drink of Englishmen; in the early eighteenth century the habit of drinking gin obtained wide acceptance and gave rise to such serious evils, both physical and moral, that laws to curb it were passed, none of them effective until 1751 when a measure both drastic and well enforced was finally enacted. Reformers of all shades of religious opinion approved of this. Wesley declared that if he had the power he would banish distilled liquors out of the world; and his enemy Hogarth aroused public opinion to the evils of drink by cartoons depicting its dreadful effects.

Among the more harmless amusements dancing, card-playing, and the theater were denounced by the reformers. Jacob Bernoulli, the mathematician, defined a dance as "a circle, the center of which is the devil." Thomas Chalkley, of Pennsylvania, declared that "as many paces or steps as a man or woman takes in a dance, so many paces or steps they take towards hell." In some cities of Continental Europe dance-halls were closed altogether; in London they were closed on Sundays though houses of prostitution were left open and much patronized on that day.

The clergy also denounced cards as "engines of Satan." In 1711 the English Baptist General Assembly resolved:

That playing at cards and earnestly contending for the same in Christian families is unbecoming and unlawful for such as profess the Gospel of Christ and unfits them for church communion.

When Wesley was asked by one of his flock: "Can't I be saved if I dance or play at cards?" he replied: "Possibly

you may be saved though you dance and play at cards. But I could not."

Serious efforts were made in many places to regulate, or entirely to close, the theaters. Pope Innocent XI (1676-89) made war on the theater and opera. He forbade all plays given for pay, turned a theater erected at much cost into a magazine for grain, and was hardly persuaded to allow the performance of two operas, and then only on condition that no women should act in them. His successors slightly relaxed his rigor. By an ordinance of 1742 Benedict XIV guarded the morals and religion of the drama, while allowing some satiric allusions to leading citizens.

In Denmark the theaters were closed in 1730. In Scotland and elsewhere they were frequently denounced by the clergy. In 1737 the British Parliament, under Walpole's guidance, forbade the acting of any play without the license of the Lord Chamberlain. This act still prevents the presentation in England of plays dealing freely with religious or moral subjects.

Those moralists who defended the theater did so on the ground that it might be made the vehicle of ethical education. In 1694 Leibniz wrote a French epigram declaring Molière as edifying as a preacher, and comedy a more effective and humane instrument of reform than the dragonnades.

In the matter of sexual ethics the Enlightenment marked the extreme of the reaction against medieval asceticism. Oscillating between the two poles of abstinence and satiety man has alternately practised hedonism and asceticism. Within the sphere of sex the romantic and the sensual views of love have fought with varying fortune. The Middle Ages were ascetic, romantic, and sacramental; the Renaissance and Reformation preached and practised a larger freedom of sex in replacing celibacy by marriage and sometimes by polygamy. Puritanism again sought to limit the indulgence of the senses to the monogamous minimum. The Enlightenment in violent reaction against the Christian and monastic and Puritan ideals, carried the hedonistic and sen-

sual view of sex to the highest point known before the twentieth century.

Love was materialized and reduced to pleasure. It was defined by Parini as "the satisfaction of desire in noble liberty"; by Chamfort as "the contact of two epidermises." Buffon declared "there is nothing good in love but the physical part"; and Voltaire said that an excellent lesson in the art of love might be learned by watching the couplings of animals. Jealousy was frowned upon and was dissembled when felt. The *philosophes* acclaimed the South Sea islands as their utopia partly because in them promiscuity, unchecked either by jealousy or by modesty, prevailed. In fashionable society neither men nor women demanded faithfulness of their partners. A French amorist, named Lectorière, very popular with the ladies, sent a circular letter making successive appointments with them, and was actually accepted by many of them on these terms. The laws no longer punished adultery. Jesuit preachers disparaged mortification of the flesh and exalted love. Peter Annet defended prostitution as a moral, and Mandeville excused it as a socially useful, institution. Hume argued for easy divorce; Boswell declared concubinage permitted by the Bible; and the great moralist Johnson wished for a harem. This was a luxury, however, reserved for princes, and generally excused, or approved, in their case. In the early eighteenth century the juristic faculty of Halle issued the following pronunciamento in an absurd mixture of German and Latin:

The popular odium in which the concubines of great princes and lords are held must cease; for such men are not subject to the laws governing private persons and are bound to give account of their actions to no one but to God; moreover such a concubine seems to partake to some degree of the splendor of her lover.

In the high society of Italy, France, and Spain, married love was ridiculed as barbarous and uncouth, and jealousy was decried as ill-bred. Sometimes the husband lived in friendship with his wife's lovers. Voltaire's "divine Émilie" was the wife of such a complaisant husband; and when she

proved unfaithful even to Voltaire, the great man, after a moment's pout, addressed no reproaches to her, and none to her lover except: "Why the devil, sir, did you have to get her with child?" In Italy the married woman's lover was recognized in society under the name of "cicisbeo." A French traveler tells, in 1766, of an actual marriage contract by which the wife was allowed to have not more than four cicisbei.

But such liberties to women were not allowed in Teutonic or in Anglo-Saxon countries. Montesquieu, generalizing the conditions prevalent in his own age, declared that women were slaves in despotisms, virtuous in republics, and free and promiscuous in monarchies. In England and in Germany women were still, as a subject class, expected to be virtuous, while perfect liberty was allowed to their lords and masters. Sometimes they lamented their chains, as did the heroine of Rowe's *Jane Shore*:

Such is the fate unhappy women find,
And such the curse entailed upon our kind,
That man, the lawless libertine, may rove,
Free and unquestioned through the wilds of love;
While woman, sense and nature's easy fool,
If poor weak woman swerve from virtue's rule,
If, strongly charm'd, she leave the thorny way,
And in the softer paths of pleasure stray;
Ruin ensues, reproach and endless shame,
And one false step entirely damns her fame.
In vain with tears the loss she may deplore,
In vain look back to what she was before,
She sets, like stars that fall, to rise no more.

Regarded as instruments of man's pleasure, girls were brought up to be virtuous wives. Lady Wishfort, in Congreve's licentious *Way of the World*, thus describes the instruction given to her daughter:

I promise you her education has been unexceptionable; for I chiefly made it my own care to initiate her very infancy in the rudiments of virtue and to impress upon her odium and aversion

to the very sight of men. . . . She was never suffered to play with a male child.

Girls of the lower class were sharply, though often ineffectually, warned of the danger of seduction. The child of the servant, says Fielding,

at the age of seven or earlier is instructed by her mother that master is a very monstrous kind of animal, who will, if she suffers him to come too near her, infallibly eat her up or grind her to pieces; that, so far from kissing or toying with him of her own accord she must not admit him to kiss or toy with her. . . . These impressions are further and deeper inculcated by school-mistresses and companions. . . . Hence, to the age of fourteen or fifteen, they entertain a mighty antipathy to master.

In British America women were freer, and perhaps more virtuous, than elsewhere. In Spanish and Portuguese America, though kept in seclusion by their men, they were, says Captain Cook, "less averse to granting amorous favors than in any other civilized part of the globe."

In general, women were kept in subjection. Sometimes they rebelled, as did Calista in Rowe's feministic play, *The Fair Penitent*:

How hard is the condition of our sex,
Thro' ev'ry state of life the slaves of man.
In all the dear delightful days of youth,
A rigid father dictates to our wills,
And deals out pleasure with a scanty hand;
To his, the tyrant husband's reign succeeds;
Proud with opinion of superior reason,
He holds domestic business and devotion
All we are capable to know, and shuts us,
Like cloistered idiots, from the world's acquaintance,
And all the joys of freedom. Wherefore are we
Born with high souls, but to assert our selves,
Shake off this vile obedience they exact,
And claim an equal empire o'er the world?

In general, women accepted their chains submissively. Lady Mary Wortley Montagu, one of the most intellectual and gifted writers of the period, wrote a friend:

I am not now arguing for an equality of the two sexes. I do not doubt God and nature have thrown us into an inferior rank; we are a lower part of the creation, we owe obedience and submission to the superior sex, and any woman who suffers her vanity and folly to deny this, rebels against the law of the Creator and indisputable order of nature.

Only in New England were women given some of the rights elsewhere monopolized by men. The pioneer in granting women suffrage, though only in a small sphere, was the liberal Brattle Street Church of Cambridge, Massachusetts, which in 1699 declared:

We cannot confine the right of choosing a minister to the male communicants alone, but we think that every baptized adult person who contributed to the maintenance, should have a vote.

The only career open to most women was marriage; and a wife's highest hope of happiness lay in her husband's indulgence. Matthew Prior gave the following good advice to husbands:

Be to her virtues very kind;
Be to her faults a little blind;
Let all her ways be unconfined,
And clap your padlock—on her mind.

Little but scorn was poured on the woman of superior mind and solid accomplishments. Steele was probably the only man of the century capable of saying of a woman that "to have loved her was a liberal education." Lord Chesterfield summarized his wide experience with the sex in these words:

Women are only children of a larger growth; they have an entertaining tattle and sometimes wit; but for solid reasoning and good sense, I never knew one that had it.

In spite of the example of some learned and cultivated women, and of a few gifted in science or in letters, the "bluestocking," as the serious woman now began to be called, was the object of general ridicule. Fielding satirizes her in

the picture of Squire Western's sister who is represented as claiming a knowledge of literature, music, history, and politics, but as always misquoting and falling into ridiculous blunders. When Le Sage introduced a burlesque woman physician into one of his plays, the satire failed because it was regarded as exploiting an impossibility. The true arts of woman were declared by James Thomson to be:

To swim along, and swell the mazy dance;
To train the foliage o'er the snowy lawn;
To guide the pencil, turn the tuneful page . . .
To give society its highest taste;
Well-ordered home man's best delight to make.

"To give society its highest taste" was indeed the career of the woman of fashion. In her salon or at her tea-table the lady reigned as queen of beauty or of wit. French styles, which varied considerably from year to year, prevailed throughout Europe. The powdered hair, dressed either very low or very high, lent piquancy to a saucy face and gave dignity to the dowager. The dress, with close-fitting bodice, ample *décolletage*, and full skirts held out by round hoops or by cushions or by "gondolas" or by hoops with "elbows," both excited and restrained masculine interest. Manners were formal and artificial; conversation affected to treat serious subjects in sprightly style. Horace Walpole found the conversation of the French women superior to that of the men, as he wrote Thomas Gray:

The generality of [French] men, and more than the generality, are dull and empty. They have taken up gravity, thinking it was philosophic and English, and so have acquired nothing in the room of their natural levity and cheerfulness. . . . The women do not seem of the same country; if they are less gay than they were, they are more informed, enough to make them very conversable. I know six or seven with very superior understandings; some of them with wit, or with softness, or with very good sense.

The conversation was not always, perhaps not usually, of Newton and Locke, of the budget and politics, of the unities

and of the *Encyclopédie*. Gossip and scandal were as much relished as they are now. A print of 1710 shows ladies sipping tea while an emblematic figure of Envy drives Truth and Justice out of the room. Frivolity and pedantry went hand in hand. Elaborate flirtations and more serious amours were carried on under the cloak of witty conversation. Manners ranked above morals; the *double-entendre* took the place of the coarse word. "Good society can do no wrong," quoth Voltaire; and even the rigid moralist Edmund Burke admitted that at the French court "vice had lost half its evil by losing all its grossness." Urbanity, worldly wisdom, tact, and indulgences, were prized above modesty and chastity. To be amiable, to be amusing, was the essence of that politeness which Voltaire declared a law of nature.

The law recognized by the fine gentleman was the law of honor, thus characterized by Horace Walpole:

There is nothing, sure, so whimsical as modern honor! You may debauch a woman upon a promise of marriage, and not marry her; you may ruin your tailor's or baker's family by not paying them; you may make Mr. Mann maintain you for eighteen months, as a public minister, out of his own pocket, and still be a man of honor! But not to pay a common sharper, or not to murder a man that has trod upon your toe, is such a blot upon your scutcheon that you could never recover your honor though you had in your veins all the blood of all the Howards!

It was not, of course, impossible for a fine gentleman to be also a good Christian. Such a character is portrayed in Richardson's Sir Charles Grandison. Though at bottom he is almost as much of a prig and an egotist as Meredith's Sir Willoughby Pattern, Grandison is held up as a model of the Christian virtues and the worldly graces. Handsome, rich, with the grand manner and a sensitive "delicacy" on all points of behavior, he is unspotted from the vices of society. Though objecting to duels on principle, when forced to defend his honor he has the knack of disarming his antagonist.

Generally, the fashionable gentleman felt able to dispense with such virtues as must have made Sir Charles insufferable. A man of good family and public school education thus describes his conception of the genteel character in Fielding's *Joseph Andrews*:

The character I was ambitious of attaining was that of a fine gentleman; the first requisites to which I apprehended were to be supplied by a tailor, a periwig-maker, and some few more tradesmen. . . . The next qualifications were dancing, fencing, riding the great horse, and music. . . . Knowledge of the town seems another ingredient; this I thought I should arrive at by frequenting public places. The final requisite was an intrigue with a fine woman.

A high degree of insolence was compatible with the manners of the aristocrat. Not in vain did the gayly dressed man of fashion carry a sword for his equals and a cane for his inferiors. Servility was demanded from the lower classes and from the untitled generally. The wealthy plebeian, such as Le Sage's Turcaret, who tried to enter high society, was not only mercilessly ridiculed but fleeced and flayed as well. The greatest genius in Europe was beaten by the footmen of a duke who found it beneath him to avenge an insulting sarcasm on the field of honor. Alessandro Verri sketched a satirical treatise on bowing, which should teach the art of "departing from the perpendicular little by little until the whole spine is presented to the person one is bowing to, as much as to say to him, 'Will your lordship do me the honor of cudgelling me?'"

Real good breeding was confined to a few circles in the large cities and to a few individuals outside of them. No one who knows the novels and plays of the eighteenth century can doubt that daily life is now more dignified, kinder, and more generous than it was then. For one Richard Steele, whose good breeding, good taste, and chivalrous courtesy would have graced any society, there were a hundred Squire Westerns who managed to combine the insolence of the aristocrat with the coarseness of the clown.

Deep drinking, hard swearing, profuse obscenity, and frequent outbursts of ill temper were much commoner then than they are now. The taste for practical jokes ran the whole gamut from rough horse-play to real cruelty. At the courts of Prussia and of Russia the art of humiliating and paining one's companions rose to genius. If a man displayed a costly new suit of clothes it was promptly stained and spoiled; if he was careful of money some trick would make him spend more than he could afford; if he declined a dish he disliked, his neighbors would stuff his mouth full of it until he choked.

5. ETHICAL THEORY

Under the pressure of material and intellectual forces the ethical theory of the Enlightenment veered from the medieval to the modern standpoint. The great revolt from Christian dogma was followed by a repudiation of Christian ethics. This involved the change from a transcendental to a rational sanction, from an ascetic to a hedonistic standard, from a romantic to a utilitarian criterion, from an ideal to a realistic method. With the decline of the clergy and nobility as privileged orders and with the rise of the middle classes to wealth and to education and to self-consciousness, went the decline of the religious and chivalrous, and the rise of the bourgeois, virtues. With great acumen Montesquieu hit the difference between a feudal and a commercial society, when he said that monarchical nations judge actions by their beauty, popular states by their utility; the former prefer the great, the latter the just; the former admire the extraordinary in conduct, the latter follow the reasonable; monarchies encourage gallantry, ruse, and servility; republics promote honesty and mercenary selfishness. The old conception of the state as an organism acting under a common purpose gave way to the new comparison of a society as a machine moved by the weights and pulleys of economic motives.

The change from one ethical climate to another was not

abrupt. All the old ideas and prejudices lingered on in some quarter or other. Though Defoe felt many of the new currents in his age, his ethics clung to the obsolescent school. While his novels border on the licentious, and occasionally toy with such themes as incest, they always point a moral by rewarding the conventional virtues and punishing the conventional vices. His treatise on *The Marriage Bed* denounces the practice of preventing child-bearing as diabolical, and holds up to detestation that "conjugal lewdness" by which a man "in effect makes a whore of his own wife." Contrast this ascetic bias with the hedonism of Hume, who said:

To imagine that the gratifying of any sense, or the indulging of any delicacy in meat, drink, or apparel, is of itself a vice, can never enter into a head that is not disordered by the frenzies of enthusiasm.

While one may note various shades of opinion among the moral philosophers both of the Christian and of the rationalist schools, the people as a whole remained only dimly conscious of the battle going on above their heads. To them it seemed immoral even to call in question generally accepted principles. Feeling nothing but resentment against those who aroused them from their habitual routine, they cherished a grudge against the intellect itself as a dangerous disturber. The association of stupidity and virtue on the one hand, and of intelligence and vice on the other, colors the most popular novels of the time, especially Richardson's. The common people acted upon the great moral precept later formulated in the epigram, "Be good, sweet maid, and let who will be clever."

Fundamental to all the more thoughtful ethical systems of the Enlightenment was the treatment accorded to the subject by John Locke. Wishing to discover a natural and universal law of conduct, he looked in vain for agreement among the nations of the world. After studying the accounts of foreign and especially of savage races, he observed:

There is scarce a principle of morality to be named, or rule of virtue to be thought on . . . which is not somewhere or other slighted and condemned by the fashion of whole societies of men, governed by practical opinions and rules of living quite opposite to others.

Failing to find a useful criterion of conduct in a consensus of opinion, Locke asks how we must govern our conduct. To do this rightly, he inquires, what do our motives desire? and answers happiness. As good and evil, then, are only pleasure and pain, moral good can only be conformity to, and moral evil violation of, some law whereby pleasure or pain, respectively, are drawn upon us by the will and power of the law-maker. There are three laws by which this is done: the divine, the civil, and the rule of opinion or reputation. Violation of the first is sin, of the second crime, of the third vice.

Notwithstanding Locke's warnings, various Christian moralists tried to find a universal basis for right conduct in the conscience, defined as the intuitive perception, by the plain man, of good, justice, and truth. Of this school was Samuel Clarke. This was the view adopted by Joseph Butler, the champion of revealed religion, who appended to his *Analogy* a "Dissertation on the Nature of Virtue." Agreeing with Locke that happiness is the end of good conduct, he argued that man is too short-sighted to judge wisely the acts conducive to his own greatest happiness, and that he has therefore been endowed by his Creator with a conscience or moral sense as a guide to the right. He protested against the growing opinion that the whole of virtue consists in acting so as to promote worldly happiness as the most terrible of all mistakes; eternity is still, in his thought, the goal of this life.

With an important modification this system survived in the thought of David Hartley, who tried to give a psychological basis to Butler's doctrine by the theory of the association of ideas. Just as misers love money first as a means to an end and then as an end in itself, so the good man loves

good acts first to promote his own happiness and then as a value in themselves.

A new and important moral theory was introduced by the Stoicism of Anthony Ashley Cooper, the third Earl of Shaftesbury (1671-1713). Educated by a tutor who spoke Latin and Greek, Shaftesbury traveled in France and Italy. Great wealth preserved him from the temptations inherent in the struggle to make a living, and poor health curbed indulgence in the pleasures of luxury. A nice and fastidious taste in literature and art colored all his thought. Rejecting the religious presuppositions that had governed the accepted ethical theories, he was unable to find a sufficient support for a moral, or a good, life in the mere calculation of reward and punishment. Virtue he thought to be really good taste in morals, founded in an instinctive affection for the good. Its highest manifestation is benevolence, which consists both in love and pity to all men and in "being a citizen of the universe and so loving whatsoever happens according to those laws by which the universe is upheld."

Common-sense sticklers for the legal theory of morals while admitting that "a moral taste might recommend virtue with something like the blandishments of pleasure and might abate the evils of vice," yet objected to Shaftesbury on the ground that a moral taste would not have the force to turn vice into virtue.¹ Other critics argued as if such a moral taste must remain the luxury of a gentleman with £10,000 a year, or as if it were only the valetudinarian's way of making a virtue of his weakness. But that in truth Shaftesbury's theory lends much needed support to ethics sapped by the decay of transcendental foundations was appreciated by the best Christian mind of the age, that of Jonathan Edwards, whose assimilation of moral good to beauty and of conscience to esthetic perception is really Shaftesbury's thesis baptized with a Christian name. In his tract on *The Nature of True Virtue*, Edwards declared:

¹ Burke: *Works* (Bohn), ii, 535.

Virtue is something *beautiful*, or, rather, a kind of *beauty*, or excellency. . . . It is not all beauty, but beauty belonging to beings that have perception and will. . . . Virtue is the beauty of those qualities and acts of the mind that are of a moral nature, i.e., such as attended with desert or worthiness of praise or blame.

This beauty the writer found both in sentiment and reason; it consists partly of "benevolence to Being in general" and partly in a rational approval of the laws of being.

In contrast to the school of Shaftesbury and Edwards, the materialistic and cynical thinkers were led by Bernard Mandeville (1670-1733). Born in Holland, educated at Leyden as a physician, he migrated to London about 1691, married an English wife, and produced a series of works that aroused and enraged the world by their astounding moral paradoxes. Among these works the only one that has found a permanent place in literature is *The Fable of the Bees* (1714). In this the author labored to prove that those passions most frowned upon by conventional moralists are the bases of national prosperity and the mainsprings of all social actions. While humility, unselfishness, and abstinence are universally praised, pride, greed, and luxury are all but universally acted upon as the motives of conduct. This is not only true, the author urged, but it is well for society that it is so, for, the love of pleasure and ambition to shine above one's fellows turn the wheels of industry and provide the incentives to useful labor and to genius:

What we call evil in this world, moral as well as natural, is the grand principle that makes us social creatures, the solid basis, the light and support of all trades without exception.

That in the course of his argument Mandeville fell into the economic fallacy of thinking that wasteful expenditure of money creates prosperity, is easily pointed out, but is less important to the student of culture than the real service done by him in making ethics realistic and free from humbug. After all, the business of the moralist is not to give human nature a bad name in order to hang it, but to see it as it is in order to make the best of it.

Mandeville's book was welcomed with a storm of abuse as "the wickedest and cleverest in the English language," and as "representing human nature in a picture of the highest deformity" by leaving out the good passion of love and by exaggerating the base passions of pride and fear. It was presented as a nuisance by the grand jury of Middlesex; and it was denounced and refuted by many theologians and even by many freethinkers. Among those who most successfully opposed his thought were Francis Hutcheson, who emphasized benevolence, or sympathy, as a natural source of human actions, and Adam Smith, whose theory of the origin and value of sympathy approaches the most recent hypothesis of the gregarious instinct, or herd-complex, as an important factor in shaping behavior.

David Hume subjected to devastating criticism the moral systems current among both the Christian and Deistic writers. Arguing, against Locke, that morality can be derived *a priori* from reason, Hume showed that ideas of good and evil are and must be deduced empirically by comparing the effects of different actions upon happiness. "Personal merit," he deduced, "consists altogether in the possession of mental qualities useful or agreeable to the person himself or to others." The utilitarian and empirical standard of conduct could not be more lucidly or more strongly stated.

If Hume laid the best foundations for a rational science of behavior, Franklin best codified its precepts in a series of maxims and recommendations. His commandments for the good life were thirteen: temperance, silence, order, resolution, frugality, industry, sincerity, justice, moderation, cleanliness, tranquillity, chastity, and humility. The sanction for the virtues he found in no transcendental standard nor in any ascetic prejudice, but merely in utility. Chastity for him meant something very different from what it meant to St. Francis. Franklin's precept and practice did not preclude the indulgence of sexual appetites as far as they were consistent with health and reputation. For him,

as for so many of the emancipated thinkers of the time, the supreme virtue is philanthropy. He wrote:

When I am employed in serving others I do not look upon myself as conferring favors but as paying a debt. . . . I have received much kindness from men and numberless mercies from God. . . . These kindnesses from men I can only return on their fellow men; and I can only show my gratitude for the mercies from God by a readiness to help his other children and my brethren.

In Franklin and in many of the other Deists the strong traces of Christian tradition can be seen combined with the newer elements derived from science. It is particularly notable that the French *philosophes*, the most radical theorists and most passionate rebels against the past, should have clung to traditional morality long after they had abandoned much, or all, of traditional religion. The first of the school, Bayle, tried to show that atheism would not corrupt or much change ethical practices; and he defined morality as the habit of acting in conformity with reason. The main precepts of rational morality he enumerated as, 1. Do not do to another that which you would not have done to yourself. 2. Give to everyone his due. 3. Honor your parents. 4. Adore God.

While most of the *philosophes* accepted Toussaint's definition of virtue as "fidelity in fulfilling the obligations imposed by reason," a few of them leveled more destructive criticism against the current morality. While La Mettrie demolished the traditional code of ethics as man-made, arbitrary, and corrupted by priestcraft and by the selfishness of the ruling classes, he believed that philosophical ethics might be based on a study of physiology and psychology. This led him to make pleasure, and especially sexual pleasure, the goal of the good life and the mainspring of rational conduct.

Denying free will and renouncing all appeals to self-abnegation, Diderot asserted that virtue consists only in enlightened regard for one's own happiness. Calling the ecclesiastical moral theology a bush of thorns deserving to

be burnt, he argued that virtue would find powerful supports in a regard for the good opinion of the world. If you are good, you will be loved; if bad, hated; and the instinctive perception of this by conscience, together with experience and calculation, will readily teach the path of the good life.

More stress on the public as opposed to the private interest characterizes the ethical system of Helvétius. Actions are judged to be virtuous, vicious, or permissible according as they are respectively useful, noxious, or indifferent in their effects on public welfare. The science of morality is therefore the science of government. It should be guided by reference to the general happiness alone, abandoning all "those virtues so called by prejudice" which have been dear to the heart of the pietist.

In supporting the utilitarian standard, Helvétius alarmed the fears even more than he excited the hostility of his contemporaries. In judging the moral teachings of that and of other ages, one must always keep in mind the constant fear on the part of apologists of tradition that the teaching that will not hurt them will prove disastrous if preached to the masses. This comes out curiously in Horace Walpole's comment:

Have you seen . . . Helvétius' *De l'Esprit*? The author is so good and moral a man, that I grieve he should have published a system of as relaxed morality as can well be imagined. . . . Even if I thought so, I would not preach that virtue and friendship are mere names, and resolvable into self-interest; because there are numbers that would remember the grounds of the principle, and forget what was to be engrafted on it.

In his *Système de la Nature* Holbach well summed up the ethical ideas of the more radical *philosophes* when he said that duties arise not in obedience to an imaginary God but are derived from man's own nature, that happiness is and should be the sole end of conduct, that reason teaches us to pursue our own happiness without hurting others, and that proper education and wise laws will insure that virtue without which man cannot attain happiness.

CHAPTER XVII

ART AND MUSIC

I. ESTHETICS

In general, the taste of the eighteenth century was the most severely classical known to the historians of art. The esthetic preferences of this period were founded, as they have been in all periods, in the prevalent social conditions, in tradition, and in the intellectual temper of the time. In earlier ages the court and church had prescribed the laws of taste; in later ages the masses revolutionized art and letters as they attained political and economic power. The opinion of the Enlightenment, however, was neither courtly and clerical on the one hand, nor democratic on the other. It was dominated, more largely than in any other period in the annals of Western civilization, by the leisured and educated aristocracy of wealth and intellect. The writer and his clientele of gentle readers ruled the provinces of literature; the connoisseur, the collector, the amateur, the critic, and the student, governed the dominions of taste.

The love of the beautiful was extended through a larger public by the exhibitions of art that it now became the fashion to give in large cities; the interest, and sometimes the passions, of the gazers were enlisted by the animated criticisms to which these now, for the first time in history, gave rise. The *Académie des Beaux-Arts*, neglected by the king, turned to the cultured public as a patron. The first "Salon," or public exhibition of paintings, was held by this society at the Louvre in 1667, and occasionally thereafter, until 1737, when the exhibitions became regular annual events. The criticisms of the pictures became more animated, and finally so violent that, in 1749, the Salon was suspended; though it was opened again in the following year.

After some years the French practice of exhibition, like the canons of French taste, spread to other countries. Spain founded her Academy of Fine Arts in 1752 to cultivate the neo-classic style. In 1757 the artists of America exhibited their works in New York, and the most successful received prizes. In 1754 a Society for the Encouragement of Arts and Manufactures was founded in England, and began to distribute prizes to native talent. The Society of the Artists of Great Britain, born as a private club in 1761, was incorporated in 1765, and changed into the Royal Academy "for cultivating and improving the arts of painting, sculpture and architecture" in 1768. As early as 1761 the members began to give annual exhibitions, at which the idle (in the words of Dr. Johnson) soon learned "to rid life of its tedium"; and at which the gay world of fashion found the best opportunity to advertise its elegant taste, whether real or affected. The membership, limited to forty, was esteemed as the badge of success. The first president, Sir Joshua Reynolds, long reigned without a rival, and gave laws to his subjects and to all the lovers of art.

"Laws" is the exact word; for, the fundamental principle of esthetic criticism throughout the Enlightenment was that art, like science, is derived from the study of nature, and is susceptible of geometrical formulation. The beautiful, no less than the true, was held to be a product of reason. Disputes arose, not between those who acknowledged and those who denied esthetic laws of nature—for there was none to deny—but between those who thought these laws could be best deduced by *a priori* geometrical method, and those who thought that they could be best discovered by that careful observation that had produced such striking results in descriptive astronomy and anatomy. Next to the direct observation of nature, study of the ancients was inculcated; for all acknowledged the supremacy of those classical masters who had first brought the fine arts to such high perfection.

These general principles were by no means entirely new in the eighteenth century. They had been set forth in the

sixteenth century by De l'Orme, and in the seventeenth by Franciscus Junius and Charles Alphonse du Fresnoy. They were those adopted by the French Academy and its leading spirit in the seventeenth century, Charles Le Brun. They were expounded by Montesquieu in an *Essay on Taste*. They were, in general, adopted by Diderot, who wrote regular criticisms of the Salons, beginning in 1759, rather to educate the public than to fathom the nature of esthetics. In his *Philosophical Inquiry into the Origin and Nature of the Beautiful* (1751) he declared that beauty is founded in the eternal, original, sovereign, and essential rules of order, proportion, relation, and harmony, revealed to us through our senses. Later he added the doctrine that "the greatest picture is that which conveys to the mind of the spectator the greatest number of the greatest ideas"—especially such ideas as appeal to the emotions. From antiquity he adopted the comparison of a picture to a poem.

Similar ideas were set forth by the English philosophers of art. Hogarth's *Analysis of Beauty* (1753) written to "fix the fluctuating ideas of taste," finds that beauty consists of three elements, the first of which is fitness, the second variety, and the third regularity. Before he had published this, a precocious student at Trinity College, Dublin, later known to fame as the statesman, Edmund Burke, had sketched the outlines of a profound treatise on esthetics published in 1756 under the title of *A Philosophical Inquiry into the Origin of our Ideas of the Sublime and Beautiful*. The introduction maintains the thesis that there must be natural laws of taste, because all persons derive similar sensations from their bodily organs; thus all men have the same conception of sweet, bitter, and sour. The fundamental doctrine of the essay is that our ideas of the sublime are derived from the emotions of pain, danger, and terror; and that our ideas of beauty come from the passions arising in pleasure, and particularly in those of sex.

The most elaborate expression of the rational doctrine of esthetics was that set forth by Sir Joshua Reynolds in his *Discourses to the Royal Academy*. His very first address

insisted on implicit obedience to the rules of art, and protested against "the false and vulgar opinion that rules are fetters of genius." The essence of beauty he found in the expression of universal laws. Beauty is the same as truth, and is apprehended by the same rational faculty:

It is the very same taste which relishes a demonstration in geometry that is pleased with the resemblance of a picture to its original and touched with the harmony of music. All these have unalterable and fixed foundations in nature.

Not only form, but color is dependent for its effect on natural psychological laws; for, continued Reynolds:

Harmony of coloring, which is in painting what metre is in poetry, is produced entirely by repetition. . . . The beauty of repetition in architecture, of pillars and other ornaments . . . proceeds from the same principle; and I believe that an inquiry into the rationale of our passions and affections would be that similar impulses whether made on the eye or the ear affect us more powerfully than any *one* impulse, unless that one be of prodigious magnitude.

Like most of his contemporaries Sir Joshua found the best examples of art in the remains of antiquity, and next to that in the Italians of the Renaissance, especially Michaelangelo and Raphael. The Dutch realists he thought too photographic—or, as he expressed it, "they represent nature just as seen in a camera obscura," whereas the true artist would "correct nature by herself," that is, eliminate the weakness, deformity, and imperfection found in all things, and select the more universal and more perfectly developed portions for reproduction.

Among the artists later than the Renaissance, Poussin was the most generally admired, both in France and England.

The prevalent ideas of ancient art were renovated, and its hold on the taste of the age was strengthened, by the extraordinarily fruitful studies of classical architecture, vase painting, and sculpture, produced during the Enlightenment. The discovery of the buried villages of Herculaneum and

Pompeii, the first of which began to be excavated in 1738 and the second in 1748, amplified and corrected the current archeology, and stimulated the already strong taste for antiquities. Servandoni, Cochin, and Count Caylus were among the first to exploit the new knowledge in building up a new esthetics. The shrine of all worshipers of the antique became the Villa Albani at Rome, with its 150 statues, 176 busts, and innumerable reliefs and vases, all so skillfully arranged in porticos and galleries that an effect of naturalness was produced that is wanting in most museums.

The most profound and original student of ancient art was Johann Joachim Winkelmann (1717-68) from whose works as from a fountain flowed many of the scholarly, literary, and artistic currents of the era. This son of a poor cobbler, self-taught, entered the university of Halle, went to Dresden, and joined the church of Rome in order to get a position enabling him to sojourn in Italy. Inspired from an early age by a love of the classics and of the beautiful, he dedicated his life to a study of art, on which he produced two important works, *Thoughts on the Imitation of Greek Works in Painting and Sculpture* (1755) and *The History of Ancient Art* (1764). The execution of the latter work made it something new in literary genres, for there had been histories of artists before (as, for example, Vasari's) but never a genetic account of the evolution of style and idea. The author explained his purpose in the opening words of the preface: ¹

The history of ancient art that I have undertaken to write is no mere chronicle of the epochs and vicissitudes of the same; but I have taken the word "history" in the wider significance that it has in the Greek language; and my purpose is to offer an essay towards a systematic body of doctrine. . . . The nature of art is the principle end; and over this the history of artists has little influence. . . . The history of art should therefore teach the origin, growth, change, and decadence of the same, together with the various styles of the several peoples, ages, and artists, and

¹ *Werke*, Band III, i.

should prove its theses, as far as possible, by reference to the extant works of antiquity.

Treating in succession the art of Egypt, Phœnicia, Persia, Etruria, Greece, and Rome, Winkelmann gave for the first time a connected account of the unconscious evolution of style, in obedience to the pressure of social forces and not as the sport of individual caprice. Each age, each school, each manner, he showed, succeeded its precursor logically, and each he connected with the current political and intellectual forces. One merit of his book was its thorough mastery of the subject; he worked with originals and he worked with more care than a Benedictine of St. Maur. Though he made mistakes, he really turned archeology into a science.

Moreover his passion vitalized not only classical philology, but deeply impressed Goethe and most of the great writers of his time. In fact his excellent diction made him one of the best German writers of his century. He had his prejudices and his misleading preferences. So fired was he for the "noble simplicity and calm grandeur" of Greek sculpture and architecture that he could see nothing in the wonderful creations of the Middle Ages or of the early Renaissance. In dithyrambic periods he hymned the Apollo Belvidere, the Venus de' Medici, and the Laocoon as the supreme glories of all time (for the Venus de Milo had not yet been discovered). His Greece, indeed, is overidealized as much as other nations are undervalued. His picture of Hellas is too bright, too cold, too limpid, too chaste. He could never admit that, with all their marvelous genius, the Greeks were in some respects savages, something between Olympian gods and Hawaiian Islanders.

Instructed by Winkelmann, inspired by Hogarth and Burke, and aroused to protest by Diderot, Lessing published in 1764 his famous *Laocoon*. Taking his title from a comparison of the ancient statue of Laocoon and of Virgil's description of Laocoon's death, Lessing examined poetry and painting so as to deduce the laws of esthetics. Both arts

were originally dedicated to the expression of beauty, "a universal concept derived from material objects, and applicable to thoughts and acts as well as to things." Each and every art, however, has its own laws and limitations, so that the generally accepted maxim, "a picture is like a poem," is false. The poet and the sculptor were each equally right in following the principles drawn from the nature of his medium. The sculptor or painter is limited to a moment of time; the poet is not. The one represents coexistence in space, the other succession in time. Lessing gave the preference to poetry as more like life and as wider in its scope than sculpture. The artist, he said, should imitate only the beautiful; the poet should also deal, at times, with the ugly in its two manifestations, as the horrible and the ridiculous. While Lessing thus laid down the rules for the creator to follow, he was wise enough to protest that rules are of no value without native genius. But even he, in the spirit of his age, believed that the rules exist and that reason is "the ear's ear and the eye's eye."²

In an acute comparison of modern and ancient art, Lessing discovered the fact that, whereas the ancients imitated only beautiful objects in their art, the moderns imitate the whole of visible nature, of which the beautiful is only a small part. In the twentieth century the sense of beauty merged in appreciation of type, or character; even in the eighteenth century Lessing could say:

Truth and expression are the first laws of modern art; as nature herself always sacrifices beauty to higher ends, so the artist must subordinate it to his general design, and not seek for it further than truth and expression allow.

While the theorists just described expounded the prevalent, classical and, so to speak, official doctrine of the age, there were some poets and other eccentrics ready to rebel against the accepted rules and to prefer what was later to be called romantic beauty. The seeds of Romanticism,

² Poem on the "Rules of the Sciences of Enjoyment, especially Poetry and Music" (1753), *Werke*, vii, 13.

which will be treated more fully in a subsequent volume, were imported from realms outside the purview of the classicist. From the Far East came objects of art very different from, and inharmonious with, the relics of Roman antiquity; from the wilderness came an appreciation of natural scenery that burst the bounds of the trim gardens then fashionable; from the Middle Ages had survived Gothic piles and ruins as beautiful as those of antiquity and yet governed by different canons.

As China was at this time teaching Europe to doubt the perfection of her religion and philosophy, it is not remarkable that she also inspired a revolt against the accepted taste in the beautiful. The Sinologists who translated Confucius and who described the wisdom and virtue of the mandarins also held up to the admiration of the Europeans the pagodas, the porcelain, the images, and vases of the Far East. Quantities of china dragons, warriors, lanterns, and all sorts of grotesque baubles, were imported and soon became the rage, first in Holland, and then in France and England. Gardens were filled with pagodas and exotic plants; houses were stuffed with mottled porcelain and other "chinoiseries."

But the rebel against the classical taste did not have to go to the ends of the earth to nourish an irregular preference. In the wilder regions of his own continent he now discovered beauties that had escaped the notice of his ancestors. Though there have been in all ages men with an eye for rugged scenery, they were extremely few until the middle of the eighteenth century. Most people before that time had loved trim gardens, safe, clean, and formal, and had disliked nature in her untamed moods and in her savage haunts. Switzerland was untrodden by the tourist. Defoe described the English Lake District as "barren and frightful." Captain Burt in 1730 contrasted the mountains of the Scotch Highlands, which he regarded as monstrous excrescences and masses of gloomy brown and dirty purple, with the beauties of Richmond park. Oliver Goldsmith preferred the fine houses, elegant gardens, statues, grottos,

and vistas of Holland to the "hideous wilderness" of Scotland. Even the poet Gray wrote in 1739:

Mount Cenis, I confess, carries the permission mountains have of being frightful rather too far; and its horrors were accompanied by too much danger to give one time to reflect upon their beauties.

Though no change in taste is sudden, it was not long after this that a new sense of the beauty of rugged scenery arose. The chief cause of this change was the development of better roads and a better police. Few travelers can enjoy natural beauty when they are in danger of death by brigands, wild animals, starvation, and the unmitigated rigors of the climate. In our own time Julian Huxley has told us how sinister, hostile, and horrible nature appears in the African jungle. Perhaps, when it is rid of venomous insects and savages, and is well supplied with good roads and comfortable inns, it will seem as friendly as the Scotch Highlands and the Alps now seem to us.

Rousseau is generally given the credit of originating the taste in wild scenery. Though he doubtless did much to stimulate it, he was anticipated by a considerable number of writers and painters. Some years before *La Nouvelle Héloïse*, a number of accounts of travels in the Alps appeared. Before Rousseau, Voltaire declared:

From gardens I would gladly flee;
Their art revolts and wearies me.
I better love the wilderness,
The rugged and primeval wood
Where nature in her native dress
Accords with my fantastic mood.

Swayed by this new taste, and educated by such painters as Claude Lorrain and Salvator Rosa, and by such poets as James Thomson, men now began to give their gardens a wilder and more irregular look. The elegant Arcadias, the smooth swards, the formal walks, the uniform flower-beds, the trees trimmed like sculpture, gave way to a more luxuriant and natural plan. Not only did romantic woods and

uncultivated dells and unyoked brooks lend a natural air to gardens, but irregularities were introduced where they were not found. The wealthy merchant, Mr. Sterling (in a play by Garrick and Colman), took more drastic means to give his garden a romantic look, placing in it "a cascade, a Chinese bridge, and a ruin which cost him £150 to put in thorough repair."

The last discovery which nourished the growing romantic revolt was that of the Middle Ages. From the time of Raphael until the end of the eighteenth century, the word "Gothic" had been used in a wholly dyslogistic sense, as synonymous with "barbarous." But in the eighteenth century some men began to discover the beauty of Gothic architecture. Horace Walpole was the chief early exponent of this taste. He first spoke of "the perfection of the beautiful Gothic," and tried to experiment timidly with it, and with other unfashionable styles, in his famous residence at Strawberry Hill. His mildly Gothic architecture, his bibelots and gimcracks, his "natural" garden, filled with "greeneth, blueth, gloomth, and honey-suckle-and-syringahood" made him famous in his own day as a gifted eccentric, and in ours as a pioneer Romantic.

2. PAINTING AND ARCHITECTURE

If Italy continued to be the school of art for all Europe, she was, in the eighteenth century, frequented more for the inspiration of her past than for the example of her present achievement. She was the museum, the gallery, the storehouse, and the emporium of the best that had survived from the age of the Roman Empire and from the age of the Renaissance. The few good artists she now produced were admired for their success in imitating their ancestors. Piranesi, at Rome, studied antiquity until he became an authority on its monuments; and then decorated the churches and palaces of Rome in a style of "romantic classicism." Tiepolo (1696-1770) showed himself a dramatic and fanciful giant set tasks by a race of dwarfs.

Antonio Canal, called Canaletto (1697-1768) made himself famous for painting and engraving the water ways of Venice. Among these native artists must be included the adopted German, Raphael Mengs (1728-79), who began his career at Dresden, lived long at Rome, and traveled throughout Europe. Imitating Raphael for expression, Correggio for grace, and Titian for color, he produced dry, correct, lifeless, and "pretty" canvases.

Among the most precious conquests of Louis XIV may be counted Antoine Watteau (1684-1721), a Fleming by race, born at Valenciennes soon after its annexation by France. Educating himself chiefly by a study of Rubens, he soon found at Paris his vocation as "a painter of *fêtes gallantes*," in which character he was admitted to the Academy of Fine Arts in 1712. His pictures mirror the secret longings of his age and environment, the manners, or at least the tastes, of the French courtiers, the pastoral loves of the beaux and belles who called themselves shepherds and shepherdesses, their elegant dalliance, their comedies and garden parties picturesquely seen in Arcadian dells. What delicacy in composition, what fineness of imagination, what tact in omitting the vulgar realities of life and in shedding over the rather vapid pastimes of gay society an enchanting light of poetry and make-believe! In Watteau's pictures the life of the courtier loses tragedy and care to take on comedy and idyllic ease. His *Embarkation for Cythera* shows a pastoral landscape with a company of fashionably dressed men and women about to set sail for the Island of Venus. Over the boat dance ecstatic cupids, and beyond it a distant wonderland of misty mountains and golden sunlight promises the land of heart's desire. Next to the *divertissements champêtres* of the gentry, Watteau loved to depict the life of the comic actors, Harlequin and Columbine, and he did it so perfectly that he infused into the light clowning that innuendo of the serious that makes even of farce a criticism of life. His landscapes are idealized play-grounds, in which a spade is called a toy and a rake a fairy wand; in which the flowers wreath themselves into garlands, and the sun-

light intoxicates like wine. One of his best pictures, and his last, shows an art shop in which noble and wealthy customers are buying the paintings that so idealized their habit and their amusements. What if his scenery was opera scenery, his pastorals the townsman's dream of country life, his art was all true to the artificial society of the age and place.

If Watteau expressed most fully the sentimental and ideal side of French court society, François Boucher (1703-70) represented its dream of realistic pleasure. This "painter of the Graces" depicted, under the guise of classic mythology, the loves, the gallantry, the sports and the dalliance of the Versailles of Louis XV, and of the Parc aux Cerfs. As Venuses, or as shepherdesses, or as ladies of fashion at their toilet, he painted his models in a libertine and ornate art that exactly fitted the rococo furniture and the erotic tastes of his patrons. His six thousand drawings and his thousand canvases display the nude with grace, with charm, with color and imagination, with—as Diderot complained—"everything but truth."

Apparently simple truth was the last thing demanded of art even in the age of reason. The reaction against sentimental or saccharine idealism found vent in caricature and satire. Born or reborn in Italy of the Renaissance, caricature grew rapidly to maturity in the partisan warfare of the Reformation. By the eighteenth century, especially in England, it had learned how to hold up to ridicule and aversion, not a party or a particular man or institution, but the whole of society. The greatest master of the satiric style in painting, and perhaps the greatest painter England ever produced, was William Hogarth (1697-1764). If he learned his technique in the school of classicism and of reason, he found his inspiration in laying bare, with a pencil as remorseless as the pen of Swift, the weaknesses, the follies, the hypocrisy, and the misery of the world he lived in. Even his portraits are caricaturesque: how he brings out the swine in Lord Lovat and the fox in Wilkes! In a series of paintings and engravings, which he compared to the scenes of a

play, he depicted *The Harlot's Progress*, from its gay and facile beginning to its conclusion in misery, prison, and death. *The Rake's Progress* exhibited the same decline of the wicked male. *Marriage à la Mode*, displaying "a variety of modern occurrences in high life," flays the sulks, the tantrums, the greed, and the adultery supposed to characterize fashionable marriage. In other paintings, Hogarth satirized the Methodists, the gamblers of the South Sea Bubble, and even Royalty, Episcopacy, and Law—these last represented as the costumes of the king, the bishop, and the judge, with nothing in the clothes.

A stronger, not to say a terrible and tragic, note is struck in drawings that depict the dark side of the age of the Enlightenment—its coarseness, cruelty, meanness, vice, corruption, and poverty. No more heart-breaking renderings of the woes and horrors of sodden pauperism have ever been made than are found in the *Beer Street*, the *Gin Lane*, the *Four Stages of Cruelty*, the *Credulity, Superstition and Fanaticism* that smite our eyes in the canvases of Hogarth. The moral is plain enough to be read at a glance; the frightful meaning is driven home with every resource of technique and with every ingenuity of the imagination.

It is a relief to turn from the savage perfection of Hogarth to the human second-rateness of Sir Joshua Reynolds (1723-92). In him England found the perfect Academician, the classic rationalist, and the genial darling of society. While his religious and classic pictures, "in the grand style," barely attained mediocrity, his portraits pleased his own and subsequent generations by their union of truth and prettiness. From his canvases English generals and statesmen look out at us as nobly as they ought; in his paintings English women and children display their modest charms to the best advantage. In his school of art, as in Browning's universe, all is love and all is law.

An even greater mastery of fashionable portraiture, and a far greater vision of the beauties of nature than can be found in Reynolds came to their own in the work of Thomas Gainsborough (1727-88). In grace, spirit, delicacy of touch,

and harmony of color, his portraits rival, and perhaps surpass, the best efforts of the first President of the Royal Academy. But while his contemporaries accepted his portraits, they rejected the landscapes that are now held to be Gainsborough's chief claim to immortality. In contrast with the academic Reynolds, he was almost the romantic poet. What rich, yet quiet colors, what fine distances, what atmosphere reflect, and enhance, in his canvases, the charm of the English countryside! The note of wistful sadness distinguishing most of them, disguises the cheerful scenes with the artist's consciousness that he was born before his time.

The change of taste in architecture from the grand style of Louis XIV to the smaller, cozier, more domestic and yet more ornate style of Louis XV reflected two great material changes in society, the rise of the Third Estate and the improvement and cheapening of the materials and furniture of house construction and decoration. One must note and emphasize again that, long before the rise of political democracy, there came into self-consciousness and self-assertion a sort of economic and social and intellectual democracy. The revolutions that took place at the end of the eighteenth century but readjusted political institutions to fit a social condition that had already established itself in other than political spheres. Hence the taste in architecture reflected the needs of the rising bourgeois class. The buildings of the twelfth century had been cathedrals and castles; those of the sixteenth and seventeenth had been royal palaces and châteaux; those of modern times have been either the private houses of the rich, or the public museums, colleges, and parliaments that served their needs, or, in still more recent times, the railway stations, factories, and office buildings called into being by an advanced industrialism. In the seventeenth century the patrons of the building trades wanted no longer imposing castles, but comfortable homes; not vast halls but boudoirs and closets; not vaulted roofs and rows of windows in two stories, but bric-à-brac and chairs grouped in circles for the *petit comité*.

At the same time the advance in the modes of industry made possible a new style of decoration. With cheaper glass, windows became more numerous and better; with improved chimneys, more delicately tinted fabrics could be used in wall-papers and in upholsteries. The vast amount of ornament that now filled the rooms of the rich bourgeois was made possible by the manufacture, on a larger scale than hitherto, of furniture, mirrors, plaster gew-gaws and bric-à-brac. Though the French *Académie d'Architecture*, founded in 1717, continued true to the classic tradition, it was powerless to prevent the decided turn of the public taste to the light and gay. From about the same time may be dated the separation of the professions of the speculative and of the operative mason, that is, of architect and contractor.

The first and most decisive changes in style came in the interior decoration of the house. Educated by the brilliant and wanton art of the opera, and commanding the services of great artisans, the rich bourgeois transformed the look of his rooms by filling them with chairs and ornaments in the new, rococo style. The walls of the rooms were cut up by pilaster-like strips; the cornices and mouldings were decorated with rambling, S-shaped scrolls imitating intentionally asymmetrical vines, flowers, leaves, and shells. New varnishes and lacquers, new methods of embroidery and lace-making, new processes of manufacturing porcelain and faience, all tended to the gay, the ornamental, and the florid.

The new taste originated in France; and the first great interior decorator was Meissonier (1695-1750), whose convex mouldings, brackets, panels decorated with shells, carving and embossing, were all "prodigies of conquered difficulties." The contemporary architect who ministered to the novel taste was Robert de Cotte (1651-1725) whose best building was perhaps the Hôtel de la Brillière, now the Bank of France.

While following French taste, Germany in some respects outdid her mistress in pushing the new modes to their extreme developments. The princes themselves capitulated to

the rococo style, and built palaces intended less for grandeur and sublimity than for comfort and gaiety. They called them by significant French names—Sansouci, or Monrepos, or Monbijou. Each palace had its long picture-galleries and museums, its fountains and kiosks, its orangeries and grottoes and vistas, its formal gardens and artificial arcadias. Each palace was stuffed with stucco ornaments, graceful chairs and sofas, mirrors, chandeliers, shell-work, and porcelain. All these ornaments were of French origin, except the porcelain that was made by Johannes Friedrich Böttcher, of Dresden. In 1709 this genius invented a new process of manufacturing beautiful and highly decorated porcelain, one of the first of the "cheap substitutes" which has done so much to level up the standard of living in modern times.

England, too, fell into the rococo style of interior decoration, filling her houses with gilt chairs, inlaid cabinets, Chinese pottery, ornamental china, and convex, or concave, mirrors. Her most famous interior decorators were the four Adam brothers. And she also produced, in Sir Christopher Wren, the creator of a great style of architecture, in some ways more conservative than that prevailing on the continent of Europe, and in other ways more progressive. Wren (1632-1723) was educated not in Italy but in Paris. While classical in details he was baroque in total effect. His remarkable vitality was given full scope by the fire of London in 1666, which necessitated the rebuilding of many churches. He did, in fact, erect no less than 53 churches in London, of which 34 survive to the present. In these he expressed new motives in the arrangement of pillars, roofing, and galleries. He first gave variety and beauty to the Protestant type of church intended as a lecture hall. Only one of his churches was a cathedral, that of Saint Paul, constructed during the years 1675 and 1710. Over this enormous church he erected a vast dome in the center. From the outside it appears two-storied, with six pairs of Corinthian pillars in the lower story of the principal façade, and four pairs in the upper story. Two steeples in front and a slender dome with another steeple and a gallery around

it complete the novel and yet commanding effect. The plan was really a compromise between "the good Roman manner" preferred by Wren and the "Gothic rudeness of the old design" demanded by the dean and chapter.

The domestic architecture of England, known to us as "Queen Anne," owed something to the Dutch taste imported by William III, and still more to the native evolution of furniture and ornament under the impact of industry and commerce.

In America, the English styles were copied and in some respects improved, at least in the erection of houses. The churches, though mostly small "meeting houses" with Puritan flavor, were often beautiful in a severe and simple way. Presently the colonists began "to lay out much of their stocks and estates in the building of fair and stately houses." No one with taste in such matters can fail to sense the great charm of the New England village, as it has survived from colonial times to the present, with its green common, its steepled church, and its abundance of comfortable, comely houses. Such villages exhibit, in a high degree, the humane beauty of democracy and the good taste of the common man with enough education, self-respect, and means, to gratify it. With little display or ostentation the New England house had all the beauty conferred by just design, careful execution, sufficient leisure and taste to demand and to supply surroundings not only commodious but pleasing to the eye. The interiors were even more delightful than the exteriors of these houses. The colonial furnishing of the wainscoted rooms has all the severe simplicity and ample strength of the Puritan character. In the South great manors introduced a grander and more lavish style; but the most beautiful of them, such as Mount Vernon and Monticello, belong to the period of the Revolution.

Not only in British America was good architecture produced. In the countries of Latin culture to the South the baroque was followed by the rococo or its even more florid Spanish sister, the churrigueresque. Men of high rank crowned their houses with battlements and decorated them

with bright colors. Among the fine churches with which every town supplied itself, the cathedral of Mexico, begun in 1573 and completed in 1813, is the flower. Its twin towers capped with bell-shaped domes rising two hundred feet above the pavement make a splendid and imposing effect.

3. MUSIC

Of all the creations of the human spirit music is, next to the higher mathematics, the most original, the most self-sufficing and autonomous, and the most independent of material, and of other cultural, influences. And yet, so seamless is the web of civilization, so infallibly does every age and every society stamp all its products with its own mark, that the music performed and composed in any given place and in any given age, is seen to bear a close relation to the culture from which it sprang. In the first place, music is dependent on the perfection of instruments and on their variety. Again, musical composition is conditioned by the scale adopted and by the knowledge of the relations of the various notes to one another. Moreover, the purposes for which music is required influence its form. In one age religious music is in the ascendant; in another dramatic airs are demanded; in another dance tunes are popular; in another love songs and lyrics attract the most attention. And, beyond all this, there is a subtle correspondence between the spirit of music and the time-spirit. One generation demands intellectual satisfaction in the complexity and intricacy of polyphony and counterpoint; another seeks only emotional stimulus or anodyne in song and sonata. In fact, the most marked turn in the evolution of modern music was that, which came at the end of the eighteenth century, from the intellectual to the emotional. In the seventeenth and eighteenth centuries the composer was a tone-artist; since the Romantic movement he has been a tone-poet.

In the seventeenth century the number of instruments was large and their quality excellent. Some of those then in use have since been discarded; others have evolved into slightly

different forms. Among wind-instruments those long in use were flutes, bassoons, trumpets, trombones, and clarions; to these were added oboes and horns about 1700 and clarinets about 1750. The greatest of all wind-instruments, the organ, though not so complicated as those now in use, was made in high perfection and esteemed particularly for church music. Among stringed instruments lutes, Moorish guitars, and theorbos were used in accompaniment and in orchestra. Various forms of viols evolved into the modern violoncello and violin. The best violins ever made were those produced by Niccolo Amati of Cremona (1596-1684) and his pupil Antonio Stradivari (1644-1737). The ancestors of the piano were the clavecin, the clavichord, clavicembalo, and the harpsichord, all played with piano-like keyboards but all sounding by strings plucked by a plectrum instead of struck by a hammer. This gave them a metallic clang not found in modern pianos, which were invented in 1711 by Bartolommeo Cristofori. The tone of most of the old instruments, which are still played by musical antiquarians like Dolmetsch and the Casadesus, was often remarkably sweet. Combined in orchestras their effect was powerful, not to say overpowering. The concerts of Louis XIV, rendered by a hundred violins and twenty clavecins at once, were compared by La Fontaine to thunder-storms. Constantyn Huygens celebrated the "angelic violins" and clavichords with iron or copper wires. Milton described

the skillful organist plying his grave and fancied descant in lofty fugues; or, the whole symphony with artful and unimaginable touches adorning and gracing the well-studied chords of some choice composer,

and again told how the "volant touch" of the musician "fled and pursued transverse the resonant fugue." Dryden, in his *Song for St. Cecilia's Day*, sang of "the trumpet's loud clangor," "the double, double, double beat of the thundering drum," "the soft complaining, warbling lute," and "the jealous pangs, the desperation, fury, frantic indignation, depth of pains and height of passion of the sharp violins."

The favorite instrument was the human voice, either solo or in chorus. The madrigal, a free form of song, was developed in the compositions of such masters as Orlando di Lasso (1530-94) into poignant or sublime ditty. In opera the recitative and arioso explored new possibilities for singers. The *bel canto*, or solo, rose to its height in the seventeenth century. The singer cultivated both beauty of tone and dramatic interpretation. The voice most prized was the soprano of the eunuch. Sometimes voices were combined in a trio of treble, contralto, and bass; sometimes accompaniment was added. Great choruses were trained for oratorio, opera, and community singing. Sometimes songs had as many as thirty parts, which made of their rendering a complicated web of mathematical curves. The art of harmonizing these various voices, or of accompanying them, known as thorough-bass or as counterpoint, was prized in proportion to its difficulty and multifariousness. The taste for this polyphony, together with the art of producing it, disappeared with the eighteenth century. How highly songs were esteemed may be noted in all the poets, of whom Milton may be taken as one of a thousand possible examples. Though a religious man, to whom words meant what they said, he compared the Italian singer Leonora Baroni to God, or to the Holy Ghost,

who, having left heaven, secretly flows through your throat in order to accustom mortal hearts to immortal sounds.

Music was composed chiefly for the churches, for the stage, and for popular songs. There was also some chamber music. The fugue, the toccata, and the fantasia were cultivated, together with innumerable forms of dances: the gavotte, the minuet, the polonaise, the sarabande, and others.

There was much study of the theory of music, with the purpose of discovering its mathematical "laws," or its psychological esthetics, or of improving its notation. Rousseau composed music, wrote much, though not much of value, on its theory, and proposed a new notation. Several musicians independently discovered that when two notes are

produced with steady intensity, a third note, of different vibration, can be heard. The earliest description of this phenomenon that I have met is found in a letter of Mersenne to Constantyn Huygens, dated January 12, 1647:

How, and when, and why is it [he asked] that when a very low note is sounded, or several notes are sounded together, one hears, in addition to their own tones, another sound, the twelfth or double-fifth higher? This happens with the human voice as well as with the great strings of a touched viol.

The same phenomenon was noticed by several musicians later, of whom one, Giuseppe Tartini, gave to the thus produced sounds the name of "Tartini's tones."

Ever since Galileo discovered the numerical relations of the various notes in the scale, there were physicists ready to explain the delight of music as dependent on mathematical principles. The elaborate counterpoint, then so highly prized, gave some basis to this theory, and also built upon it. Leibniz defined music as "the arithmetic of a mind unconscious that it is reckoning." Jean Philippe Rameau in 1722 published a *Traité de l'Harmonie réduite à ses principes naturels*, endeavoring to give a rational explanation of pleasant sound. The most elaborate and determined effort to reduce music to mathematics was made by the scientist Euler in a tract entitled *Attempt to construct a new Theory of Music on the strictest principles of Harmony* (1739). In this he divided musical theory into two parts, the first treating the physical nature of sounds and the second explaining the psychological laws of the perception of pleasant and unpleasant sounds. His fundamental idea is that simple, rational, numerical relations govern the intervals usable in music. In a memoir prepared much later (1764) *On the true Character of Modern Music*, he expounded the evolution of the art as the increasing complexity of the harmonic relations, so that what are at first felt as discords or dissonances are later resolved into concords by means of a more recondite mathematical formula.

While adopting the theory that pleasure in music depends

on the mathematical relations of the notes, Descartes laid more emphasis on the emotional quality of sound. In a tract entitled *An Abstract of Musical Theory* (1618) he declared:

The object of music is sound; its purpose is to delight and to arouse in us various emotions; for it is certainly possible to compose tunes either sad or gay.

Dryden's great ode, *Alexander's Feast, or, The Power of Music*, elaborates Descartes's theory and makes it concrete, by telling how the lyre of Timotheus excited in Alexander the successive passions of pride, anger, love, and compassion.

Turning from the theory of music to its actual production, we discover opera as one of the great new creations of the seventeenth century. With its brother, Oratorio, Opera was the child of the Counter-Reformation and of the Florentine Renaissance. About the middle of the sixteenth century Filippo Neri founded the oratorio, a recitative of Biblical stories with interposed choruses. In the last quarter of the same century amateurs of music met in the house of the Bardi at Florence to restore Greek drama, which they knew to be musical. From these experiments in solo and chorus singing, true opera was born. Probably the first piece to which the name can be properly given is the *Eurydice* of Jacopo Peri, produced in 1600. The fine "bel canto" from this, the *Funeste Piaggie*, has been sung with success in recent years. More remarkable was the work of Claudio Monteverdi (1567-1643), a virtuoso, singer, conductor, and alchemist, warrior in youth and priest in old age, who produced some operas first at Mantua and then at Venice. One of these, *The Combat of Tancred and Clorinda*, was revived by the Metropolitan Opera Company of New York, with great success, in 1929.

The frivolous and sensual, languid and sentimental soul of the eighteenth century is preserved for us in the arias of Pergolesi and Paisiello, in the symphonies of Scarlatti and Sammartini, and in the sonatas of Tartini and Boccherini. By this time the popularity of the opera had so increased

that the most festive day in every Italian city was that on which the season for it opened. The first comic opera was *La Serva Padrona* of Pergolesi. A great advance towards the modern form of musical tragedy was made by Alessandro Scarlatti (1659-1725), who was born at Palermo but lived most of his life at Naples. One feature of the old opera that would seem strange to us was the use of the soprano voices of eunuchs in the parts of the heroes. The higher the scream of Achilles or of Orpheus, the more enraptured the audience.

Through the opera Italian music conquered Europe. The virtuosi of this nation exercised a hegemony in the realm of art comparable to that of the French *philosophes* in the realm of letters. In no country was the opera earlier imported or more enthusiastically received than in France. In 1647 Mazarin brought to Paris Rossi's *Orfeo ed Euridice* and put it on the stage at immense expense. Though it lasted six hours, it ran three nights a week for two months. Though the academicians blamed it for mixing too many kinds of art to be agreeable to the principles of Horace, and though the court found it boring, it soon won applause from the bourgeois. The anomalous features of the opera were discarded and its excellencies retained in the ballets that became the most popular diversions of the court of Louis XIV. A vast number of sumptuous ballets were put on the stage, some of them with librettos by Molière and with music by Lulli. Many of Molière's longer plays show the influence of opera, being interspersed with songs and dances; in one of them, *Le Malade Imaginaire* there is staged a miniature pastoral opera. In 1669 an *Académie d'Opéras* was founded, to be followed three years later by the more imposing Royal Academy of Music.

In the eighteenth century the absurdities found in the tragic opera were often censured. Voltaire wrote:

It is a spectacle equally bizarre and magnificent, where the eyes and ears receive more satisfaction than does the mind, where the servitude to music makes necessary the most ridiculous faults,

where arias are sung while a city is sacked, and where dances are executed around a tomb . . . where gods, demons, magicians, prodigies, monsters, and palaces are created and destroyed in the twinkling of an eye. But we tolerate and even love these extravagances because we are in fairyland.

About the time that Voltaire was writing this *Casanova* was moved to laughter by seeing, at Paris, an opera called *Fêtes vénitiennes*, in which the doge and twelve counselors, dressed in bizarre togas, danced a jig. It was at this time, also, that the Italian actors at Paris obtained permission to give parodies of formal operas. These parodies, together with the "clown operas" or *opéras bouffes*, won greater popularity than did the tragedies.

Opera began to be given in England at the time of the Commonwealth; for, strange to say, it escaped the Puritan laws against the theater. After the Restoration it continued to be given sporadically. Native composers both wrote regular operas and music for songs interspersed in spoken plays. On July 2, 1661, Pepys saw Sir William Davenant's opera, *The Siege of Rhodes*, Part II, and esteemed it "very fine and magnificent." The same critic reported that, on February 27, 1668, he saw Massinger and Dekker's *Virgin Martyr*, and that

that which did please me beyond anything in the whole world was the wind music when the angel comes down, which is so sweet that it ravished me, and, indeed, in a word, did wrap up my soul so that it made me really sick, just as I have formerly been when in love with my wife.

Among the great English composers of the seventeenth century Henry Purcell (1658-95) takes first place. After composing many lovely songs, and music for Dryden's *Aurenge-Zebe* and Shadwell's *Libertine*, he produced, in collaboration with Nahum Tate, who wrote the libretto, the fine opera *Dido and Æneas* (1689). In this there is no spoken word; the whole action being sung in recitative. In ideas and in technical resources Purcell was so far ahead

of his time that only recently have his merits been fully appreciated.

On January 5, 1674, Evelyn heard the first Italian opera ever given in England. But it was not until the reign of Anne that the Italian genre really conquered England, when Nicolini and a band of eunuchs invaded the island, in 1705. In 1710 George Frederic Handel (1685-1759), a Saxon by birth, came to live in England and, while there, produced many operas and oratorios. His first secular piece, *Rinaldo*, was followed by forty others, of which only a few detached arias are now given. His first oratorio, *Esther*, based on Racine's play, was followed by *Athaliah*, *Saul*, *Israel in Egypt*, the *Messiah*, and many others. Though careless of form, Handel gave his Biblical dramas a power, sublimity and sweetness that has caused them to outlive his operas in popular favor. The simple liquid melody of his suites and largos, the lively clang and bang of the *Harmonious Blacksmith* (when played on the harpsichord), and the sentimental sweetness of his songs made him extremely popular with the younger generation. While old Squire Western loved only English catches, his daughter Sophia "would never willingly play any music but Handel's." "I love a tender sentiment," she explained, "and would willingly pay the price of a tear for it." On the other hand Hogarth, who satirized everything, ridiculed the oratorio Judith in one of his cartoons; and Horace Walpole wrote, in 1743: "The oratorios thrive abundantly. For my part, they give me an idea of heaven, where everybody is to sing, whether they have voices or not."

But to return to the opera of 1710—it was received with a mixture of applause and ridicule. Tackell denounced it as "nonsense well tuned and sweet stupidity." Addison reviewed *Rinaldo* in the *Spectator* of March 6, 1711, referring to Herr Handel as the Orpheus of this age, but ridiculing the childish and absurd scenes, in which the hero, dressed in ermine, sings in an open boat exposed to a pasteboard tempest. Two weeks later Addison returned to the subject of the Italian opera, which he thought unreasonable and

trifling. Strife arose between the partisans of the Italian Bononcini and the German-English Handel. The versifier John Byrom wrote:

Some say that Signor Bononcini
Compared to Handel is a ninny;
Others aver that to him Handel
Is scarcely fit to hold a candle.
Strange that such difference should be
'Twixt tweedledum and tweedledee.

Pope devoted to the opera the following lines of the *Dunciad*:

When lo! a harlot form [Opera] soft sliding by,
With mincing steps, small voice, and languid eye:
Foreign her air, her robe's discordant pride
In patchwork fluttering, and her head aside. . . .
Casts on the prostrate Nine a scornful look,
Then thus in quaint recitativo spoke:
"O cara! cara! silence all that train:
Joy to great Chaos! let Division reign!
Chromatic tortures soon shall drive them hence,
Break all their nerves and fritter all their sense:
One trill shall harmonize joy, grief and rage,
Wake the dull Church and lull the ranting Stage. . . .
Strong in new arms, lo! Giant Handel stands,
Like bold Briareus with a hundred hands;
To stir, to rouse, to shake the soul he comes,
And Jove's own thunders follow Mars's drums."

And Chesterfield added this severe censure:

Operas are essentially too absurd and extravagant to mention. I look upon them as a magic scene contrived to please the ears and eyes at the expense of the understanding; and I consider singing, rhyming, and chiming heroes and princesses and philosophers as I do the hills, the birds, the beasts who amicably joined in one common country dance to the irresistible tune of Orpheus' lyre.

Notwithstanding the absurdities that excited the risibilities of the philosophers, opera won a vast popularity with

the vulgar, and finally captivated even the critics by its appeal to the ear. In 1766 Horace Walpole wrote of Niccolò Piccinni's *Cecchina*: "It has the most charming music that I ever heard in a single piece, and is crowded every time."

The only opera composed by a native Englishman during the eighteenth century that has lived long was a comic piece by the poet Gay, intended to satirize both the society of London and the stage successes of Handel. The idea of a "Newgate pastoral" was thrown out in conversation by Swift. When, upon this hint Gay wrote *The Beggar's Opera* (1728) he gave the manuscript to Congreve to read and received the criticism that "it would either take greatly or be damned confoundedly." When Gay found a manager named Rich to put it on, it did take so greatly as to make "Rich gay and Gay rich." As it is revived from time to time the auditor may easily appraise it. When I saw it in 1920, I was struck by its extremely modern note. The catches, the humor, the tricks, the plot, the gay costumes, might have adorned the latest musical farce. The hero of the piece is the highwayman MacHeath, who has just married Polly Peachum, the daughter of a receiver of stolen goods. When he is imprisoned, he is saved by Lucy Lockit, the daughter of the jailor. Torn between the two loves, he sings, "How happy with either I'd be, were t'other dear charmer away." The whole piece was received with wild enthusiasm. Even the critic Johnson, while fearing that "there is in it such a labefactation of all principles as may be injurious to morality," praised the "novelty, general spirit, and gaiety, which keep the audience always attentive and dismiss them in good humor."

As early as 1590 Germany developed a native musical drama which prepared the way for the enthusiastic reception of Italian opera in the next century. The courts of Vienna, Munich, Dresden, and Berlin, vied with each other in rivalry for the best singers. The best Italian performers would be bribed or abducted by such means as sometimes led to international complications. All Europe was shaken, in 1685, by the contest of Saxony and Mantua for the pos-

session of the prima donna Margarita Salicola. In 1678 the first German opera-house was erected at Hamburg, a polished and wealthy republic that gave to the people what had hitherto been the monopoly of princes. In 1700 the Berlin opera opened with a ballet, *La Festa del Hymeneo*. While the people and the nobles enjoyed the music, the intellectuals looked askance at the strange mixture of Roman mythology, Italian melodrama, and irrational convention. The Swiss poet Gottsched branded opera as "the most preposterous work ever invented by the human brain."

In addition to Handel Germany produced a great composer of the new genre in Christoph Willibald Gluck (1714-87). His *Orfeo ed Euridice* (1762) joins great intrinsic beauty and high dramatic effect. With the classical and mellow sweetness of the golden age, the composer has wonderfully combined the romantic yearning of a deep emotion. The sorrow of Orpheus for the lost love, the song that softens even the disdainful shades of Tartarus throbs with passion and glows with fire. Making the melodies subservient to the portrayal of character Gluck first realized the dramatic possibilities of tunes:

I shall try [he said] to reduce music to its true function, that of seconding poetry by intensifying the expression of sentiments and the interest of situations without interrupting the action by needless melodies.

It was the newer feeling coming to birth, too new to please the taste of the critics, who agreed with Handel that "Gluck knows no more of counterpoint than does his cook." In *Alceste* and in *Iphigénie en Aulide* and in *Iphigénie en Tauride* Gluck almost attained the supreme quality of his *Orfeo*. He was, indeed, the first and greatest of the composers of dramatic music before Mozart. Deserving the title accorded him by Haydn of "the father of modern orchestration," Gluck expressed emotions and achieved climaxes inconceivable in the older masters.

If the opera may be regarded as the child of the Renaissance, the ecclesiastical and secular music of the organ, the

piano, and the orchestra, may be traced back to the Reformation. The great hymns of Luther and his followers were the most living element of German culture to survive the Thirty Years' War. They inspired Johann Sebastian Bach (1685-1750) whose music represents the artistic side of Lutheranism as truly as the poetry of Milton and the etching of Rembrandt express the cultural aspect of Calvinism. Born at Eisenach, in the shadow of the Wartburg so rich in memories of the Minnesingers and of Luther, he was educated as organist and then became teacher of music in various small Saxon towns. In 1708 he was called to a position at the court of Weimar, which he held for nine years. The next six years saw him promoted to the office of conductor of music at the court of the Duke of Anhalt-Cöthen. In 1723 he became organist and choir-master at the church of St. Thomas, Leipzig, where he spent the rest of his life, except for short visits to other German cities. His reception at the court of Frederick the Great in 1736 was the occasion of the composition of the lively and martial Brandenburg Concerto. In 1741 he formed with others the Concert Society of Leipzig. He had many children, several of whom were highly gifted as performers and even as composers of music.

While earning a strenuous and rather meager livelihood in his professional occupations, he was composing that vast amount of new music that was so little appreciated in his own day and that has been acclaimed by posterity as one of the supreme works of genius. His output was enormous, and has not been quite fully published even in our own time. His favorite instruments were the organ and the clavichord, on both of which he attained a proficiency of performance that surpassed all previous virtuosity. Indeed he reformed the technique of playing on a keyboard, improving the fingering and, for the first time, making free use of the thumb. His touch, which found its highest achievement rather in the manner of withdrawing the finger from the struck note than in the manner of striking it, produced the delicate legato effect that he prized.

Inheriting to the full the prevalent taste for elaborate counterpoint, his pieces are polyphonic, depending for their highest effect on the skillful blending of several melodies. He was of the opinion that:

Figured bass is the most perfect foundation of music. It is executed with both hands in such a manner that the left hand plays the notes that are written, while the right hand adds consonances and dissonances thereto, making an agreeable harmony for the glory of God and for the permissible gratification of the soul.

The most powerful esthetic effects of Bach's music are due to the architectonic mind that knew how to fit copious and animated details into a single grand and Gothic harmony. With an absolute mastery of the technique of composition he combined a rare capacity for expressing what may be called musical thought. His religious music, founded in Lutheran orthodoxy and written for the Protestant congregation, expresses, as does only Milton's poetry, the mind and spirit of the Reformation, and his *Mass in B Minor* probably speaks to a far larger audience than does Milton's *Paradise Lost*.

The fugue, with its possibilities of elaboration and of profundity, was one of Bach's favorite and most successful forms. The organ, under his domination, seems to have added another dimension to music, making all other, or at least all previous, composition seem flat and thin. Solemnity, tragedy, jubilee, playfulness, and humor are all expressed in the unfathomable network of notes. Listen to the great cantata *Christ lay in Death's Dark Prison*, to the *Mass in B Minor*, to the chorales and preludes as they are sung and played each May at Bethlehem, Pennsylvania. What might and majesty, what depth and largeness, what dramatic changes from solemn wailing to bubbling joy, what adoration, what faith! Indeed, for most of us, the art has outlived the theology that inspired it.

While the musician finds Bach almost perfect the layman, to speak frankly, finds him at times a little monoto-

nous, a little too deep and lofty for unremitting attention, a little too high and good for human nature. The air of heaven is too stimulating for the earth-born mortal. Though the master displays infinite variety and freshness in theme and in harmony, he had little sense of dramatic fitness. The same phrase recurs in the song of Pleasure seducing Hercules and in the Virgin's song to her baby; the same theme is used in Hercules's reply and in the sacred aria in which Zion is bidden to Prepare for the Bridegroom.

Though less sublime, Bach's profane music is perhaps more interesting than are his sacred compositions. For the *Well-tempered Clavichord*, first published in 1799, he wrote a large number of toccatas, concertos, and other pieces containing a world of tranquil beauty. Some of his sonatas display humor, as does the little essay in the Italian operatic style called *The Strife of Phœbus and Pan*. In Pan's prize aria the sound echoes the sense of the words: "In dancing and jumping how stag-stag-staggers my heart!" And when Midas gives the judgment for Pan, a low heehaw by the violins reminds the hearer that the judge has ass's ears.

Like all geniuses of the first rank, Bach stands at the end of one era and at the beginning of another. He brought to its close, by carrying to its utmost possibilities, the age of polyphony and counterpoint. He began, by his extraordinary depth, the Romantic movement that flowered only after his death. Little thought of until the very end of the eighteenth century, he was rediscovered by Mendelssohn, and since then he has been the chief inspirer of all musicians until our own times. The mighty surge and uprush of pure music in the nineteenth century, like nothing else in the history of art except the building of the Gothic cathedrals, is more indebted to Bach than to any other man.

It is one of the glories, and perhaps one of the paradoxes, of the Age of Reason, that it brought forth this mightiest exponent of that purest art in which reason counts for little and sensation for almost all.

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